

A New Look at God

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A New Look at God

BY

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To
Billy Graham

A modern preacher who holds these fundamental beliefs:

The inerrancy of the Bible as an infallible divine revelation and guide.

The virgin birth of Jesus.

The substitutionary blood atonement.

Christ as a risen Saviour and living mediator between God and man.

The imminent return of Jesus in person to establish His kingdom.

The resurrection of the saints at His coming again.

"I am not ashamed of the gospel of Christ: for it is the power of God unto salvation to every one that believeth; to the Jews first, and also to the Greek."—ROMANS 1:16.

P R E F A C E

WE ARE living in the most unprecedented era of the world's history, a conglomeration of so many great ages—the electronic, the atomic, the space—all compressed into one. In the last few decades, especially in the last few years, man has made great strides in exploration of the physical world about him. This is particularly true in the discoveries of the marvels in the atom and of the wonders in space. All these have helped the author to gain a deeper insight into things spiritual and a greater understanding of God and His ways, for he has found that the God of the infinite is also the God of the infinitesimal. It is for the purpose of sharing his findings with the reader that this volume was written. It is hoped that many readers will find God as a result of reading this book.

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PHILIP S. CHEN

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INTRODUCTION

EVEN though God never changes (Malachi 3:16), man's concept of God changes, depending on time and location. Thus the conceptions of God of a neolithic man would most likely differ from those of a modern man. So will also the ideas of deity of a headhunter in the deep jungles of Borneo differ from those of a civilized man in any part of the United States.

Man's conception of God also varies according to how he relates himself to the different ways in which God is revealed. God makes Himself known to man in three ways—through inspiration, revelation, and his physical environment. Inspiration involves God's disclosure of Himself through His Word, the Bible. By revelation He speaks to the individual directly, often through visions and dreams. More often, however, man learns about God and His ways through his physical environment, the most important of which is nature.

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God's Word, like His character, never changes. Those who accept the Bible as inspired in its entirety generally have the same conception of God. Only as man rejects certain portions of the Bible is his idea of God distorted.

God's second method, personal revelation, is not common today. In Biblical times, He often revealed Himself through visions and dreams. In modern times, He employs this method less frequently. However, when He does, seldom is His message misunderstood or man's ideas of Him perverted.

The factor which more and more is effecting the greatest change in man's realization of God is the change in his environment. Since nature is God's creation, the more man comprehends nature, the more he understands its Creator. Astronomy, by unfolding the vast universe, helps man to apprehend the infinitude of God. Botany and mineralogy, through an examination of the gorgeous colors of the flowers and the symmetry of crystal structures of minerals, help to explain the beauty of God's handiwork. Zoology and ornithology point to God's wisdom. Chemistry, by elucidating the orderly arrangement of electrons, protons, and neutrons in the atom and of the atoms in the molecule, discloses God's design and order. Physics, whose laws deal with all forms of energy residing in combustion engines, electricity, explosives, atomic nucleus, and rockets and missiles, teaches man God's mighty power. Thus a modern

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man through discoveries of laws governing his physical world sees and senses God's omnipotence, omniscience, and omnipresence to a greater degree than his ancestors. We who are living in this enlightened scientific age are fortunate indeed, for Jesus has said: "Verily I say unto you, That many prophets and righteous men have desired to see those things which ye see, and have not seen them; and to hear those things which ye hear, and have not heard them" (Matthew 13:17).

As science unravels more of the mysteries of life and of the universe, it brings man ever closer to God. The October, 1960, *Reader's Digest* carries an article entitled, "Seven Reasons Why a Scientist Believes in God." Here are the seven reasons given by the author, A. Cressy Morrison, former president of the New York Academy of Sciences:

"First: By unwavering mathematical law we can prove that our universe was designed and executed by a great engineering Intelligence.

"Second: The resourcefulness of life to accomplish its purpose is a manifestation of an all-pervading Intelligence.

"Third: Animal wisdom speaks irresistibly of a good Creator who infused instinct into otherwise helpless creatures.

"Fourth: Man has something more than animal instinct—the power to reason.

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"Fifth: Provision for all living is revealed in such phenomena as the wonders of genes.

"Sixth: By the economy of nature, we are forced to realize that only infinite wisdom could have foreseen and prepared with such astute husbandry.

"Seventh: The fact that man can conceive the idea of God is in itself a unique proof."

In support of his first point, Dr. Morrison says: "Suppose you put ten pennies, marked from one to ten, into your pocket and give them a good shuffle. Now try to take them out in sequence from one to ten, putting back the coin each time and shaking them all again. Mathematically we know that your chance of first drawing number one is one in ten; of drawing one and two in succession, one in 100; of drawing one, two, and three in succession, one in 1,000, and so on; your chance of drawing them all from number one to number ten in succession, would reach the unbelievable figure of one in ten billion."

"By the same reasoning," Dr. Morrison affirms, "so many exacting conditions are necessary for life on the earth that they could not possibly exist in proper relationship by chance." Among these conditions he lists the fact that the earth rotates on its axis at the right speed so that vegetation neither burns up from heat nor freezes from cold; that the sun is just the right distance away; and that the moon is not close enough to produce continent-engulfing tides.

It is God's purpose that man should derive spir-

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itual benefit from nature. Paul made this clear in Romans 1:20: "Ever since the creation of the world his invisible nature, namely, his eternal power and deity, has been clearly perceived in the things that have been made. So they are without excuse" (R.S.V.). That was why Jesus often spoke in parables when preaching to His disciples about the kingdom of God. If He were on earth today, He would probably use the radio to show how God in heaven can hear the prayers of His children on earth below, or the X-ray to explain such scriptures as 1 Samuel 16:7: "For the Lord seeth not as man seeth; for man looketh on the outward appearance, but the Lord looketh on the heart."

From these evidences, it appears that scientists should be the strongest believers in a supernatural Being. Unfortunately, not all scientists are adherents to a belief in a transcendent Being. Science does one of two things to a scientist; it makes him either a staunch Christian or a confirmed infidel. The way he views and interprets scientific evidence determines the difference. The words quoted by John which Isaiah spoke against the unbelieving Jews may well apply to the obstinate scientists of the modern day: "He hath blinded their eyes, and hardened their heart; that they should not see with their eyes nor understand with their heart" (John 12:40). Jesus' own indictment is recorded in Matthew 13:15: "For this people's heart is waxed gross, and their ears are

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dull of hearing, and their eyes they have closed ; lest at any time they should see with their eyes, and hear with their ears, and should understand with their heart, and should be converted, and I should heal them."

But this disbelief on the part of many scientists that natural phenomena offer proof of God is matched by the refusal of many theologians to accept the Biblical revelation of Him. Contemporary theologians like Paul Tillich, Reinhold Niebuhr, Rudolf Bultmann, and Bishop James Pike believe that much of the Bible is myth. Perhaps it is because of a lack of fundamental scientific knowledge or an unwillingness to accept what nature is trying to teach man. To rely upon blind faith could be dangerous. Faith when substantiated by reason provides a more solid foundation.

The Bible teaches that we are created rational beings. God does not want us to believe in everything blindly. He expects us to "be ready to give an answer to every man that asketh (us) a reason of the hope that is in (us)" (1 Peter 3:15). Therefore, it is our duty to study nature and our environment to find support for our spiritual beliefs. Solomon said, "I applied mine heart to know, and to search, and to seek wisdom, and the reason of things" (Ecclesiastes 7:25).

Practically all scientific discoveries, with the chief

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exception of the theory of evolution, give man a clearer and deeper understanding of God. We may mention the following as examples:

The theory of relativity

The unified field theory

The newest theory of cosmology

Mass-energy equivalence

Radioactivity and atomic physics

Recent discoveries in biochemistry and genetics

Recent discoveries in medicine and nutrition

In the succeeding chapters of this book we shall discuss these and other scientific discoveries which prove, support, or elucidate certain Biblical truths.

Chapter 1

GOD'S ORIGIN AND
DWELLING PLACE

IN GENESIS 1:1 we read: "In the beginning God created the heavens and the earth."

The reader may ask, "Where was God before He created the heavens?" "Where could He be when there were no heavens?" "Who made Him?" These are very interesting questions, and many people have sought to know the answers. Unfortunately there are no answers to such questions; for they are unanswerable. If He whom we call God were created by someone, that someone, and not the created being, would be God. The question of who created that someone would still exist and one could keep on asking the same question over and over again; for there would always be someone at the head of the list whose existence one would like to trace. Reason demands that there must be an ultimate reality. Dr. A. E. Maness stated the case

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well when he said: "The rational mind knows that 'something cannot spring from nothing.' Such a truth as that needs no proof. It is self-evident. What kind of demonstration could make it clearer than it is? All the imaginable zeros of infinity could never make one. Nothing is the only thing that can come from nothing; and since nothing is not a thing, no kind of a thing can come from nothing. . . . So the conclusion of our syllogism is correct. Something always was; something always has been. . . . The popular mind: 'The Something that always was is God.'"—*Evidences of the Divine Being*, pp. 16, 17.

Regarding the subject, God has not left us in total darkness. In Revelation 22:13 we read: "I am Alpha and Omega, the beginning and the end, the first and the last." In Isaiah 43:30 He says: "Ye are my chosen witnesses, saith the Lord, and my servant whom I have chosen: that ye may know and believe me, and understand that I am he: Before me there was no god formed, neither shall there be after me." Since we know that God is eternal, these texts actually imply that He is a self-existing God with neither beginning nor ending.

DIGRESSION

Before we become fully engrossed, the author wishes to digress a little and offer a few words of

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caution. It is true that we have been created rational beings, and God expects us to know what is possible for the human mind to comprehend and be able to give all "the reason of things" (Ecclesiastes 7:25; 1 Peter 3:15). However, He does not require us to know the impossible or to explain everything. These He wants us to ignore for the present, waiting for a future time when He can reveal them to us in the unfolding of His wisdom.

There are spiritual things which the carnal mind cannot comprehend, because it lacks spiritual discernment (1 Corinthians 2:14). Moses recognized this principle when he said: "The secret things belong unto the Lord our God; but those things which are revealed belong unto us and to our children for ever" (Deuteronomy 29:29). There is great danger in over-speculating about things which are beyond human comprehension. Attempts to probe too deeply into questions for which only God has the answers have made skeptics, atheists, and infidels out of some of the world's most brilliant scientists and philosophers. So let us beware.

GOD'S DWELLING PLACE

Even though God is a spirit and is omnipresent; yet He is a person as we, for Genesis 1:27 says, "God created man in his own image," and Jesus said in John 14:9: "He that hath seen me hath seen the fa-

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ther." God is also spoken of in the Scriptures as if He has a face (Revelation 22:4), eyes (Isaiah 1:15), ears (Psalm 116:2), a mouth (Deuteronomy 33:27), hands (Isaiah 5:12), and feet (Genesis 3:8).

Although He is present everywhere by His spirit, yet He resides in a definite dwelling place, for in 1 Kings 8:30 we read: "Hear thou in heaven thy dwelling place."

God's own words referring to His dwelling place are recorded in Isaiah 57:15: "For thus saith the high and lofty One that inhabiteth eternity, whose name is Holy; I dwell in the high and holy place."

God's dwelling place is the heaven of heavens, according to J. J. Von Allmen, from whom we quote: "Thus Deuteronomy 10:14, 1 Kings 8:27, Psalm 148:4, Nehemiah 9:6 speak of 'heaven of heavens' to denote the supreme Heaven, the dwelling place of God."—*Vocabulary of the Bible*, p. 165.

The exact location of God's dwelling place in the physical universe is not given in the Bible. However, its general direction, according to the paragraphs quoted below, is in the Orion nebula.

"A woman who was not an astronomer—who, on her own confession, did not remember ever having looked into a telescope—nevertheless used an expression regarding the nebula in Orion, that requires a great deal of astronomical lore to explain. It happened near the close of the year 1848.

"This writer was describing the events that will

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take place under the seventh vial of God's wrath as predicted in Revelation 16:17-21. At that time, when the voice of God sounds from the throne, there will be a mighty earthquake, and 'the sun, moon, and stars will be moved out of their place. They will not pass away, but be shaken by the voice of God. Dark, heavy clouds came up, and clashed against each other. The atmosphere parted and rolled back; then we could look up through the open space in Orion, whence came the voice of God. The holy city will come through that open space.'—*Early Writings*, page 41." ¹

Now what is Orion and what is the Orion nebula? Is there anything significant about them?

Orion is the brightest constellation in the northern sky. It is the finest region of the whole sky for observation without a telescope. According to Greek mythology, Orion was a giant and a mighty hunter. The ruddy star, Betelgeuse, marks his right shoulder, and Bellatrix his left. Blue Rigel, a magnificent object which is at least 2000 times as luminous as the sun, is his left foot. Three bright stars across the middle constitute Orion's belt, and three fainter stars form a sword hanging from his belt.

The central star in the sword appears a little fuzzy without a telescope; with one it is found to be a magnificent nebula, called the Great Orion Nebula. According to many astronomers, the Great

1. Lucas A. Reed, *Astronomy and the Bible*, p. 236.

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Orion Nebula is the most splendid object in the whole heavens. Below are but a few descriptive quotations.

"The great nebula in Orion is known to be the most glorious body of its class that the heavens display."—Robert Ball, *In the High Heavens*, p. 236.

"The telescope does not reveal in the heavens a more wonderful object than the great nebula lying just below Orion's belt."—*The Stars in Song and Legend*, chapter on Orion.

"All other irregular nebulae sink into insignificance compared with that shown by an opera glass as a silvery patch round one of the stars in Orion's sword. This extraordinary object has been under effective observation for 250 years, and during the last eighty has been monographed, mapped, measured, figured, and photographed with a diligence worthy of its preeminence."—*The System of the Stars*, p. 264.

Now where is the open space in Orion? Is there anything significant about this open space?

As we shall see presently, the open space is located in the middle and brightest part of the Orion nebula, and about its magnificence and stupendity many astronomers have expressed their amazement. The following remarkable statements were made by Dr. Edgar Lucien Larkin, director of the Mount Lowe Observatory.

"The reader is invited to come along with me

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and help to sink a sounding line into the most appalling and amazing deeps of interstellar space, and to aid in the exploration of a huge cave, depth, or recess in the nebula in the constellation Orion.

"Recent photographic transparencies made on glass plates at the Mount Wilson Observatory reveal the optical property of perspective. What has all along appeared to be a flat surface of nebulous matter, the beautiful shimmer and sheen in the great nebula in the sword of Orion, is shown, in the central regions of these negatives, to be the mouth of a cavern, a deep opening receding into the mighty distance beyond. These large negatives, taken by means of the great concave mirror, five feet in diameter—the largest in the world—actually show depths below the shining surface of the nebula, the effect being that the eye looks into the opening and along the apparent sides to the rear.

"The wintry months are here. Orion rises early in the evening, displaying splendid and regal robes of night, garments of cloth of pearl and glittering diamonds. The nebula can be faintly seen by the unaided eye, and better in an opera glass. Go look in the silent hours, and summon all your mental powers, imagining that the central region of the nebula is really the gigantic opening of a cavern leading into inconceivable depths.

"The outlying portions of the nebula are resolved, in these transparencies, when further magnified,

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into areas of streamers, wisps, sprays, filaments, and starry lace; and these are well seen in the great telescope up here on Echo Mountain. But all these are less in glory than the supernal vision of the interior of the cavern—the abyss, the chasm in infinity.

“The nebula of Orion is wider in angular diameter than the moon, whose diameter is thirty-two minutes of arc. Cut off all outlying streamers, and treat mathematically a diameter of thirty-two minutes, and the distance and dimensions of the nebula at once submerge human thought as by a flood from infinitude.

“The opening of this recess is at least fifteen minutes of an arc in diameter; and with this value let the mathematical results obtain.

“If we look at any shining point in this nebula in a powerful telescope, and measure its position with exceeding accuracy by means of a micrometer, to-day, and repeat the process six months later, a most astonishing discovery will be made; namely, the two positions are exactly the same. But the earth, during the six months, has moved to a distance from where it was at first of 186,000,000 miles. See what this means. Take the same telescope to the nebula, turn and look this way; then the diameter of the earth’s mighty orbit, a line of 186,000,000 miles long, would appear to be so short that it could not be measured with the micrometer, an instrument able to measure the diameter of a fine hair.

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"But the opening of the cave is at least fifteen minutes wide. How find its width in miles? This is impossible by measuring any shining portion of the nebula; so we must measure nearby stars, and then assume that the adjacent nebula is at their distance from the earth. Some of these neighboring stars are binaries, these being cases where two stars—giant suns really—revolve around their common center of gravity. By high and abstruse mathematical processes, fair determinations of their distance from the earth can be made.

"The result of a number of measures of the Orion binaries is that their mean parallax is one two-hundredth of one second of arc. Parallax means, go to a star, look back this way, and measure the angular distance of the earth from our sun. The linear distance is 93,000,000 miles and the angular measurement from these stars in Orion is one-two hundredth of one second. Then two hundred lines, each 93,000,000 miles long, end to end, would fill out one second of arc, or 18,600,000,000 miles. There are sixty seconds in one minute, or 1,116,000,000,000 miles, which, multiplied by fifteen (the opening in Orion being fifteen minutes of an arc wide), equals 16,740,000,000,000 miles. And this is the enormous width of the colossal opening leading into the cavern.

"Then ninety thousand little rings of the dimensions of the earth's orbit, each with a sun in the cen-

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ter, could enter this abyss side by side and be engulfed. And all these dimensions are less than the reality, without doubt.

"The distance of the rear of the chasm from the opening cannot be measured; but it must be at least three times greater in depth than width, or fifty-one trillion miles. But this is also the distance of the giant sun Sirius from the earth. It and Alpha Centauri following would find ample room within this cosmic deep. Torn, twisted, and distorted masses of shining gaseous matter, adorned with myriads of glittering points—starry suns, no doubt—form the gigantic walls; and the whole forms a scene of indescribable magnificance.

"Human speech is impotent. Pen of writer, brush of artist, alike are lifeless and inert in any attempt even to describe this interior. Mammoth Cave glories in Kentucky, illumined by electric lights, are so beautiful that words cannot be used in their description. What, then, should be said of the mighty cavern in the depths of Orion's nebula? Torn, twisted, and riven masses of shining gas, irregular pillars, columns and stalactites in glittering splendor, and stalagmites rising from the mighty floor! The appearance is that of light shining and glowing behind Herculean walls of ivory or pearl, and these studded with millions of diamond points—shining stars."—*Signs of the Times*, Jan. 1914, p. 35.

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Another astronomer had this to say about the open space in Orion: "Many believe that if we could look with instruments powerful enough, back into the abyss, this cavern in the skies, we would see the gates of gold, the city of the Eternal King. I received a thrill when I ran across the following lines of Tennyson, in which he makes reference to this very same open space in Orion. He wrote: 'A single mystery star, which is the second in a line of stars that seem a sword beneath a belt of three, I never gazed upon it but I dreamt of some vast charm concluded in that star to make fame nothing.'"—Philip Knox, *Sky Wonders*, p. 38.

Lucas A. Reed says: "We believe, then, that without question, beyond or through this inapproachable light of Orion lie, somewhere, heaven and the throne of God.

"Orion is a wonderful spectacle to the eye of man, even at the enormous distance from which he views it; but oh, what must it be to sweep through those avenues of brilliant and radiant glory! There is room there for the city of the coming kingdom to pass through in its journey to this earth, that wonder city which John saw in holy vision, coming down from God out of heaven, prepared as a bride adorned for her husband; a city having the glory of God, her light as the flashing of one immense, magnificent diamond (Revelation 21:2, 10, 11)."—*Astronomy and the Bible*, p. 253.

Chapter 2

THE UNIVERSE—ITS SIZE AND DURATION

THE UNIVERSE includes all the works of creation. However, when we talk about the universe, we usually think of the heavenly bodies: planets, suns or stars, galaxies, nebulae, etc. We all know that the earth is a member of the solar system with the sun in the center, around which planets Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Pluto revolve.

The sun is a star. Even though the sun is a million times as big as the earth, it is by no means the biggest star in the universe. The sun has a diameter of 865,000 miles, but the diameter of the star Antares is 390,000,000 miles and that of Epsilon Aurigae is about 2,400,000,000 miles.

The sun is among some 100 billion stars making up the galaxy called the Milky Way. The Milky

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Way is shaped like a disk and is about 80,000 light-years across, and about one-tenth as thick (A light-year is the distance light travels in a year at the speed of 186,000 miles per second—nearly six trillion miles). The sun is located some 26,000 light-years from the center of the Milky Way, which is rotating at a rate which would swing the sun completely around it in about 200 million years.

The Milky Way is only one of the many millions of such galaxies (or nebulae). These galaxies tend to collect in groups containing up to a thousand or more, and we call these groups clusters or super galaxies. So there are myriads upon myriads of stars in the universe. Dr. Harlow Shapley of Harvard estimates that within the relatively narrow limits of our present optical telescopic reach there are perhaps more than 100 thousand million billion stars (or the figure 10 with 19 zeros following it).

Besides the visible heavenly bodies, there is a great deal of gas, mostly hydrogen, and dust, so that space is not exactly empty. The total mass of the gas and dust is probably equal to that of all the visible celestial bodies put together. One or two atoms of hydrogen or a few specks of dust per cubic yard seem small, but the universe is so large that the number of tons of these particles in space is close to the number 10 followed by 48 zeros.

The 200-inch telescope on Mount Palomar in California reaches out to more than two billion light-

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years, but radio telescope may take us even farther.

This brings us to an interesting topic called radio astronomy. It is the study of heavenly bodies by means of radio telescopes in place of the usual optical telescopes. It is a more powerful tool for the study of remote heavenly bodies because radio telescopes can locate them far beyond the visible range of the 200-inch telescope, just as electron microscopes are more powerful than the ordinary optical microscopes. This is possible because there are stars that send out radio signals, and for this reason we call them radio stars. Faintest celestial signals now detected have only a hundred-millionth of the power of a television signal.

The radio telescopes are very large in size in comparison with optical telescopes. A 250-foot giant is located at the University of Manchester, England. A double interferometer consisting of four aerials each 320 feet long was constructed at Cambridge. Since its completion in 1955, according to a report that came out several years ago, it has located 1,936 radio stars. But the largest is the one the Navy is building near Sugar Grove, West Virginia. The big disk of this new radio telescope will have a diameter of approximately the length of two football fields placed end to end. Theoretically this telescope should be able to pick up signals emitted by stars 38 billion light-years away, 19 times the distance probed by the 200-inch telescope at Mount

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Palomar. *Newsweek* calls this radio telescope the 5-acre "ear" or "giant ear."

This reminds the author of what David wrote in Psalm 19:1-4: "The heavens declare the glory of God; and the firmament sheweth his handiwork. Day unto day uttereth speech, and night unto night sheweth knowledge. There is no speech nor language, where their voice is not heard. Their line is gone out through all the earth, and their words to the end of the world." Until radio engineer Karl G. Jansky of Bell Telephone Laboratories discovered radio astronomy in 1931, no one ever knew that heavenly bodies "declare" and "utter speech," "their voice" might be "heard," and "their line (of communication by radio) is gone out through all the earth, and their words (radio signals) to the end of the world." Can there be a better description in poetic language of the radio stars than that by the ancient poet three thousand years ago?

THE EXPANDING UNIVERSE

Up to a few years ago the universe had been thought to be finite and its size 5 to 6 billion light-years. Part of the evidence was based on Einstein's Spherical Universe theory which he postulated from his General Theory of Relativity. According to him, the universe was like a sphere. The shortest distance between two points is not a

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straight line, but the geodesic following the great circle around the sphere. A space traveler traveling in the same direction in this kind of universe would eventually come back to the same spot, just as an earth traveler traveling in a circle on the earth would eventually arrive at the same spot from which he started his journey.

The following amusing thing may take place in such a spherical universe according to James A. Coleman: "An astronomer might someday build a superduper telescope and we can imagine what will happen when he looks through it. He may see a shiny luminous object which looks like the moon, but with a peculiar-looking curved tree growing out of it. Only after many hours of quiet and careful scrutiny will it dawn on him that he is looking at his own gleaming baldpate, the light from which has gone completely around the universe and returned!" —*Relativity for the Layman*, p. 118.

Einstein, basing his calculation on the average density of matter in the universe, found the radius of the spherical universe to be about 200 sextillion miles. So we see that, according to Einstein, our universe is closed and finite.

Einstein's model of a closed, finite universe was temporarily satisfactory until it was invalidated by the important discovery of Dr. Edwin P. Hubble in 1929. Dr. Hubble discovered in that year that all the other galaxies were rapidly running away from

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us, indicating that our universe is in a state of very rapid expansion. Now let us see how he made the discovery.

We all know that when a train is approaching, the pitch of its whistle gets higher, and when it is moving away, its pitch gets lower. This is known as the Doppler Effect. The effects are similar in the case of light. When the source of light is approaching, the whole spectrum of the light is shifted towards the violet; if the source is moving away, the whole spectrum is shifted towards the red. The latter phenomenon was what Hubble observed, and it has since been known as the "red-shift." Not only are all the galaxies moving away from us, they are moving away from each other; and the more distant the galaxy, the faster it moves. From the amount of displacement or shift of a chosen spectrum line and its normal wave length at rest (in the laboratory on earth), it is possible to calculate the velocity of the receding motion. Thus, the nearby super galaxy, which is about 25 million light-years away and which contains some 500 galaxies, was found to have a speed of recession of 750 miles a second. The most distant object that was photographed recently by Dr. Rudolph Minkowski through the 200-inch Hale telescope on Mount Palomar was found to be six billion light years away and to have a speed of recession of 46 percent the speed of light, or 90,000 miles a second.

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According to Dr. George Gamow, "The present rate of expansion is about .000,000,01 per cent per year, so that each second the radius of the universe increases by ten million miles."—*Mr. Tompkins in Wonderland*, p. 10.

So, instead of a spherical universe that is closed and finite, as Einstein would have us believe, our universe is probably open and infinite. According to Dr. Gamow, it is saddle-shaped.

The strangest thing about the whole affair is that no one has thought of the many texts in the Bible which showed this so-called expanding universe nearly 3000 years ago. Here they are (*Italics supplied*):

"Thus saith God the Lord, he that created the heavens, and *stretched* them out. . . ." (Isaiah 42:5).

"I have made the earth, and created man upon it: I, even my hands, have *stretched* out the heavens, and all their host have I commanded" (Isaiah 45:12).

"And forgettest the Lord thy maker, that have *stretched* forth the heavens, and laid the foundations of the earth . . ." (Isaiah 51:13).

"He hath made the earth by his power, he hath established the world by his wisdom, and hath *stretched* out the heavens by his discretion" (Jeremiah 10:12. See also Jeremiah 51:15).

"Who coverest thyself with light as with a gar-

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ment: who *stretcheth* out the heavens like a curtain" (Psalm 104:2).

"It is he that sitteth upon the circle of the earth, and the inhabitants thereof are as grasshoppers; that *stretcheth* out the heavens as a curtain, and spreadeth them out as a tent to dwell in" (Isaiah 40:22).

". . . I am the Lord that maketh all things; that *stretcheth* forth the heavens alone . . ." (Isaiah 44:24).

"The burden of the word of the Lord for Israel, saith the Lord, which *stretcheth* forth the heavens, and layeth the foundation of the earth, and formeth the spirit of man" (Zechariah 12:1).

According to Webster, the word "stretch" is a synonym of the word "expand." If rubber balloons were known in the days of the children of Israel, these prophets, instead of saying "who stretcheth out the heavens like a curtain," would probably have written "who expandeth the heavens like a balloon."

Recently Dr. Allen Hynek of the Dearborn Observatory of Northwestern University used the very expression in his article, "The Expanding Expanding Universe," in the February 6, 1961, *Current Science*: "The whole of space seems to be expanding or *stretching out* in all directions." (Italics supplied.)

The following significant facts should be noted also:

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1. The expansion of the universe occurred in the past and continues in the present, as both the past tense and the present tense of the word "stretch" were used. In the first four passages you will find the word "stretched," and the last four passages the words "stretchest" and "stretcheth."

2. Stretching out the heavens took place before and after the creation of the earth, indicating again the past and the present act of expansion.

The importance of the continuous expansion from the past to the present will be realized as we continue our discussion of this intriguing subject.

Now that we have discussed what is happening in the universe, the next logical question to take up would be, "How did the universe come about and what is going to happen to it?" In other words, we have discussed its present. Now we shall discuss its past and its future.

THE ORIGIN OF THE UNIVERSE

There are at present two schools of thought on the origin of the universe, both headed by scientists of world renown. One is known as the steady-state theory, whose chief proponent is Dr. Fred Hoyle of Cambridge. As stated by him, "The theory of a steady-state universe leads to many startling conclusions: that the universe had no beginning and will have no end, that space as well as time is infinite,

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that matter is continually being created throughout space.”—*Scientific American*, Sept. 1956, p. 157.

Dr. Hoyle believes that the density of matter in the universe is constant. To maintain the constance, new matter is steadily being created in space at a rate which exactly compensates for the thinning of matter by expansion. As a consequence, new galaxies are continually being created.

This theory is not in harmony with the teachings of the Bible, which allude to only one creation and that marked the beginning of the universe. According to Genesis 1:1, the universe had a beginning. Except for the creation mentioned in Genesis 1, there are no other creations of the present universe mentioned. Both facts are included in the first verse of the Bible, “In the beginning God created the heavens and the earth.”

There are also scientific facts that contradict this theory. If new galaxies are continually being “born,” they should vary in age from mere youngsters to veterans, but the galaxies around our own galaxy, the Milky Way, were found to have the same age. Also the theory fails to account for the continued existence of radioactivity, for if the universe had always existed, all radioactive materials would have disintegrated or decayed to the final, non-radioactive lead.

Now let us examine the so-called “big-bang” theory of Dr. George Gamow, the famed theoretic-

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cal physicist of the University of Colorado. According to him, the universe began about five billion years ago; the elements being created first in about 30 minutes time and from them the stars and galaxies.

According to another proponent of this theory, Dr. Ralph A. Alpher of Johns Hopkins University, all the original atoms of material in the original creation came into being in 10,000 seconds, or a little less than three hours—*Physical Review*, April 1, 1949.

The reasoning behind this theory, as explained by Bertrand Russell, is like this: "If the clusters of galaxies are getting farther and farther apart, then in the past they must have been closer together than they are now. Suppose we were to take a movie film of the expanding universe, over a period of many millions of years, so as to record the whole history of the expansion. If such a film were to be shown backwards, then it would show the history of the universe in reverse. Instead of moving away from one another, all the clusters of galaxies would appear to be moving towards one another. As the film ran back, they would get closer and closer together, until presumably they were so close together that there were no gaps between them any more. . . . Those people who think it (creation) did occur are inclined to refer to the highly condensed

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state as 'the beginning of the universe' or 'the time when the universe was created.' ”¹

This beginning of time when the nebulae were all together can be easily calculated by extrapolating backward in time from their known distances and velocities, and this was found to be around five and a half billion years in the past. This theory was postulated a number of years ago. Since then, the age of the universe has been revised to 10 billion years according to one authority and 7 to 13 billion years according to others. Carnegie Institute of Technology's Annual Report even showed that a distant group of stars whose light, analyzed by a delicate photometric technique, indicates that they may be 25 billion years old.

How close these estimated ages correspond to the actual time when God created the heavens and earth, no one can be certain. One thing that is positive is that the universe had a beginning and modern scientific observation and theory have confirmed it.

A most recent confirmation came from the British radioastronomer Martin Ryle, who found that colliding galaxies get more crowded in space as they get farther away. For instance, the density of the stars in the colliding galaxies in Cygnus 300 million light years away from us was found to be at least three times higher than it should have been accord-

1. Bertrand Russell, *The ABC of Relativity*, Rev. Ed., pp. 110, 111, by permission of George Allen & Unwin, Ltd.

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ing to the steady-state theory. Since light takes one year of time to cover one light year of distance, galaxies 300 million light years away from the earth are viewed as they were 300 million years ago. Their higher density means that 300 million years ago they were closer together and had not had the time to spread out as thinly as at present.

Another interesting thing about this theory is the way its proponents describe the manner of creation. Dr. George Gamow himself says: "My belief is that at the start matter was composed simply of protons, neutrons, and electrons. After five minutes the universe must have cooled enough to permit the aggregation of protons and neutrons into larger units, from deuterons (one neutron and one proton) up to the heaviest elements. This process must have ended after 30 minutes, for by that time the temperature of the expanding universe must have dropped.

"To many a reader the statement that the present chemical constitution of our universe was decided in half an hour five billion years ago will sound nonsensical. But consider a spot of ground on the atomic proving ground in Nevada where an atomic bomb was exploded in 1953. Within one microsecond (a millionth of a second) the nuclear reactions generated by the bomb produced a variety of fission products. In 1956, 100 million million microseconds later, the site was still 'hot' with the surviving fission products. The ratio of one micro-

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second to three years is the same as the ratio of half an hour to five billion years! If we can accept a time ratio of this order in the one case, why not in the other?"—*Scientific American*, Sept. 1956, pp. 152, 153.

The following is the way Walter Baade describes it: "We are now able to outline in bold strokes at least a part of the history of the galaxies. Some five billion years ago there was a big burst of star formation in all galaxies. In the spheroidal galaxies, which rotate slowly, apparently all the available dust and gas were formed into stars at that time, for we find in them today only old (Population II) stars."—*Scientific American*, Sept. 1956, p. 98.

Another writer describes it in a similar manner: "It is as if, at that time in the dim past, there was a mighty explosion which catapulted fragments out to form the nebular universe as we now see it."—Harold P. Robertson, *Scientific American*, Sept. 1956, p. 80.

This is certainly not the slowly evolving process by which the evolutionists used to describe natural processes. It barely got started, then it was finished. The language of suddenness used here is more like the words of the psalmist who said: "By the word of the Lord were the heavens made; and all the host of them by the breath of His mouth. . . . For He spake, and it was done; He commanded, and it stood fast" (Psalm 33: 6-9).

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THE FATE OF THE UNIVERSE

The future fate of the universe is foretold in the Bible. It declares that both the heavens and the earth shall pass away. Two phases are involved: (1) their aging, and (2) their final dissolution by fire.

The passing away is foretold by the following text:

"Heaven and earth shall pass away, but my words shall not pass away" (Matthew 24:35; Luke 21:33; Mark 13:31).

"And I saw a great white throne, and him that sat on it, from whose face the earth and the heaven fled away; and there was found no place for them" (Revelation 20:11).

These texts used the word "heaven" in the singular, but Isaiah uses it in the plural. "For, behold, I create new heavens and new earth: and the former shall not be remembered, nor come into mind" (Isaiah 65:17).

Their waxing old is foretold in the following texts:

"Lift up your eyes to the heavens, and look upon the earth beneath: for the heavens shall vanish away like smoke, and the earth shall wax old like a garment . . ." (Isaiah 51:6).

"Of old hast thou laid the foundation of the earth:

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and the heavens are the works of thy hands. They shall perish, but thou shall endure: yea, all of them shall wax old like a garment . . ." (Psalm 102: 25, 26).

The following texts predict their final dissolution:

"And all the host of heaven shall be dissolved and the heaven shall be rolled together as a scroll . . ." (Isaiah 34:4).

"But the day of the Lord will come as a thief in the night; in the which the heavens shall pass away with a great noise, and the elements shall melt with fervent heat, the earth also and the works that are therein shall be burned up. Seeing then that all these things shall be dissolved . . . wherein the heavens being on fire shall be dissolved, and the elements shall melt with fervent heat?" (2 Peter 3:10-12).

Phillips translation renders it as follows: "The heavens will disappear in a terrific tearing blast, the very elements will disintegrate in heat and the earth and all that is in it will be burned up to nothing."¹

Now let us see what science has to say about these predictions. Are the heavenly bodies really waxing old? Is it possible for them to disintegrate into nothing by a terrific blast?

First let us consider the scientific evidences showing that the universe is becoming old.

1. From *The New Testament in Modern English*, copyright J. B. Phillips 1958. Used by permission of The Macmillan Company.

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Allan R. Sandage, speaking from the point of view of the expanding universe, says: "If the universe began with an explosion from a super-dense state, its rate of expansion was greatest at the beginning and has been slowing ever since because of the opposing gravitational attraction of its matter, which acts as a brake on the expansion."—*Scientific American*, Sept. 1956, p. 171.

In other words, it had the greatest vigor when it was young; now it is slowing down as it gets older.

The second law of thermodynamics states that "the free energy of the universe is decreasing." For instance, iron has a great tendency to combine with oxygen to form rust or iron oxide. Energy is given off in the process, so that the energy contained in the iron oxide is less than the total amount of energy possessed by both iron and oxygen. The slow oxidation of organic matter follows the same path. These are examples of reactions that proceed spontaneously; the products formed at the end of the reaction always possess less free energy than the reacting substances before the reaction.

The energy that does the world's work is mainly derived from the combustion of coal, petroleum, and natural gas. The carbon dioxide and water that are formed are low in energy content and will not further react to liberate more energy. These as sources of energy are dwindling rapidly as the years go by.

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The newly discovered atomic energy works the same way. The natural occurring radioactive elements like uranium and thorium disintegrate to form other radioactive substances like radium, polonium, etc., with the liberation of large quantities of energy in the process, until non-radioactive lead is formed in the end and the process finally stops.

The sun (and other stars) gets its energy by changing hydrogen into helium. The resulting loss of three per cent of weight is converted into heat and light, which dissipate into space. It is losing four million tons of matter per second and after an estimated thirty-five billion years it will be a dead star. Astronomers tell us that there are many dead, dark stars in the universe.

Now what about the eventual dissolution of the universe as predicted in 2 Peter 3:10-12? Can this be supported by scientific facts and theories?

Before the discovery of atomic energy, men could not imagine how a massive world like ours could be destroyed by fire. There is no known chemical reaction, such as the burning of combustible materials like paper, wood, coal, oil, gas, or even brimstone which destroyed Sodom, that can burn the earthy material to nothing or obliterate it. However, from the explosion of the atomic and hydrogen bombs scientists have learned that by means of nuclear reactions produced by the disintegration (chain reaction) of the elements on a large enough

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scale, man can accomplish what was described by Peter. Observe what happened to the steel tower in an atomic bomb test in New Mexico. There the steel tower on which the bomb was hung before it exploded was completely turned into vapor, and the rush of air ten miles away was strong enough to knock men down.

John Pfeiffer, in describing the explosion of the Crab Nebula, which the Chinese saw in the year of 1054, stated: "It was a supernova, a star which explodes like a bomb in mid-air. But instead of ripping itself into bits of celestial shrapnel, as most supernovae are thought to do, this star created a kind of smoke ring, or rather a smoke shell, a vast, spherical cloud of gas which expanded at enormous speeds like a burning balloon. The Crab Nebula, which resembles a ball of tangled yarn more than a crab, is all that remained to mark the catastrophe."²

2. John Pfeiffer, *The Changing Universe*, p. 90, Random House, 1956.

Chapter 3

TWO WAYS TO GO TO HEAVEN

THERE ARE two ways to go to heaven, God's way and man's way. In this chapter we shall examine the known facts about these two ways, and a comparison will be made between the two.

MAN'S WAY OF REACHING HEAVEN

For the last six thousand years, man has always been tied to mother earth's apron strings by its gravitational force. Some people say this is what God intended, for, as indicated in Isaiah 45:18, man was to inhabit this earth. But on October 4, 1957, man discovered that he could break away from earth. It was on this day that the Russians shot into space the first man-made satellite, the Sputnik; this event marked the beginning of the Space Age. Since then, many earth satellites, moon probes, and sun

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orbiters have been shot into space or placed in orbit, such as Russia's Sputniks and Luniks, and America's Vanguard, Explorers, Pioneers, and Discoverers. The more spectacular shots are the following:

On October 4, 1957, as mentioned above, the Russians shot off the first man-made satellite, Sputnik I. It orbited 588 miles from the earth at the farthest point and weighed 184 pounds.

In November, 1957, Russian Sputnik II carried the dog Laika to orbit at over 1,000 miles from the earth. The dog stayed alive in the 120-pound satellite over a week.

In December, 1958, the American Project Score, weighing 101 pounds, went into an orbit whose farthest distance was 920 miles from earth. It broadcast President Eisenhower's Christmas greeting as follows: "This is the President of the United States . . . my voice is coming to you from a satellite . . . I convey to you and to all mankind America's wish for peace on earth."

In January, 1959, Russian Lunik I called Metchta ("Day-dream") orbited around the sun 120 million miles from it. It weighed 3,245 pounds.

In May, 1959, an American Jupiter missile sent two monkeys (Able and Baker) 360 miles into space. The animals returned alive after traveling a distance of 1,700 miles.

In September, 1959, the 860-pound Russian Lunik II hit the moon.

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In October, 1959, Russian Lunik III photographed the other side of the moon and sent back detailed pictures from 260,000 miles away. Lunik III weighed 614 pounds.

In February, 1961, the Russians launched an interplanetary 1,419-pound Venus probe from a 14,295-pound circling earth-satellite, Sputnik VII.

On April 12, 1961, the Russian cosmonaut Major Yuri Gagarin went around the world in 89 minutes in a 10,414-pound spaceship called Vostok ("East") in an orbit 100 to 188 miles from the earth.

On May 5, 1961, U. S. astronaut Navy Commander Alan Shepard had a 15-minute, 302-mile ride in a Mercury capsule carried by a Redstone rocket 115 miles above the Atlantic Ocean. This was followed on July 21 by another sub-orbital flight by U. S. astronaut Air Force Captain Virgil Grisom.

On August 6 and 7, 1961, the second Russian cosmonaut Major Gherman Titov circled the earth 17 times in a 110.5 to 160 mile orbit and traveled about 435,000 miles in 25 hours and 18 minutes in his 10,430-pound spaceship Vostok II.

On October 27, 1961, the U. S. launched Saturn C-1 rocket 95 miles into space. The 460-ton rocket stood 162 feet high and developed 1.3 million pounds of thrust. It was by far the most powerful rocket ever launched by man.

On February 20, 1962, U. S. astronaut Marine

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Lieutenant Colonel John Glenn made a 4 hour 36 minute orbital flight in his Friendship 7 spacecraft, circling the earth three times at an altitude of 100 to 160 miles with a velocity of 17,530 miles per hour.

Space travel is not so easy as thought by those who have already decided to get on the first commercial flight to the moon. Let us see what tremendous problems confront man in reaching outer space and traveling there.

Space Travel Is Hazardous—

First of all, to get beyond the earth's gravitational field, a space ship must reach a speed of 25,000 miles per hour. This seven-mile-per-second speed is known as the earth escape velocity. The force exerted upon the ship as a result of the acceleration required to reach this speed is many times that of gravity (g), the exact amount depending on the duration. If the duration of the acceleration is 9 minutes 31 seconds, the force is 3 g; if the duration is 2 minutes 6 seconds, it is 10 g. The acceleration one experiences riding in an express elevator rapidly rising to the 20th floor, or in a whirling contraption in an amusement park when its centrifugal force reaches a maximum around a corner, is nothing in comparison with the several-times-g acceleration to be experienced in a rocket. Only astronauts of

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superb constitution can stand such blackout-causing and body-battering forces for a short time.

Space begins at 65,000 feet or 12 miles above the earth. At 100,000 feet or 20 miles, the atmospheric pressure is only one per cent of that at sea level. Unless the space traveller is protected by a pressurized cabin or a pressurized suit provided with oxygen, his body fluids will start boiling.

When the space ship is beyond the gravitational pull of the earth, and when the rocket no longer accelerates but climbs from momentum, the space traveller will experience the weird sensation of weightlessness. He will be floating in mid-air, not being able to tell up from down. Certain physiological changes will take place. Warren R. Young wrote in *Life*, "During zero-g weightlessness, muscles might atrophy and coordination might diminish from disuse. Even worse neurological results are forecast by some medical men. . . . Other physiological effects of weightlessness include overfilling of the right side of the heart . . . possible loss of function of the upper opening of the stomach . . . and disturbance of normal elimination of body waste."

In addition to strains mentioned above, there are other hazards facing our space traveler. First is the extreme temperature. He can expect a potential temperature of about 250° F. on the sunny side of the space ship and about -250° F. on the shady side.

Also there is the doughnut-shaped Van Allen

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radiation belt centering around equatorial and temperate regions of the globe. Its inner edge is about 400 to 1,000 miles distant from the earth and its outer edge 70,000 miles out. According to General Electric engineer Norris F. Dow (*Time*, May 9, 1960), "When an inhabited satellite orbits 2,200 miles above the earth, its crew will be riddled by the fast-moving radiation belt. If unshielded, the spaceman will be inflicted with about 3,000 rem per week—many times more than a lethal dose."

Dow estimated that 100 pounds of lead per square foot will be required to keep Van Allen flare radiation at a safe level. That figures at no less than 11,000 pounds—more than the total weight of one of the heaviest satellites yet put into orbit, the U.S.S.R.'s Sputnik III—for shielding a cramped, man-carrying capsule only six feet in diameter.

Space Travel Is Expensive—

The cost for placing a satellite into a 300-mile orbit is estimated at about \$15,000 for each pound of payload, or \$1,500,000 to place a 100-pound object in space. The giant Saturn rocket, which the U. S. launched in October, 1961, will eventually carry a payload of 23,000 to 25,000 pounds. The cost of such a rocket will amount to about \$48 million.

But the largest rocket being planned is the Nova, which will have a payload (called Apollo) of 150,-

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ooo pounds. Its booster alone would weigh as much as eight diesel locomotives. Capable of generating a 12-million pound thrust, this missile may well transport three men to the moon and back on an 11-day trip on September 20, 1967. The program is expected to cost between \$800 million and \$1 billion.

At the rate our space program is growing, one wonders how soon we shall actually fulfill the statement made by Dr. Fred Whipple of Harvard Observatory some time ago when he said, "The Egyptians utilized 20 per cent of their national potential for 20 years to build the Great Pyramid. If we applied the same percentage of national effort for the same time, we could put the pyramid in orbit."

Sometimes people wonder why the space program is so costly. Let us consider the amount of fuel consumed in a rocket or missile. According to *Aerospace*, the amount of fuel consumed by an intercontinental ballistic missile in one minute would supply the needs of an average motorist for 30 years. A rocket ship with a 6-million-pound thrust will burn 1,140 tons of fuel in about two minutes.

Here are some figures which will show the costs of going to different heavenly bodies. According to George Abell of the University of California, it would cost \$10 million to send a rocket to the moon. This amounts to about a nickel for every man, woman, and child in the country. A trip to the sun

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will cost every citizen \$20. Sending a rocket to the nearest star would cost every citizen \$5 million. The cost for our entire space program for the next year is estimated at 9 to 10 billion dollars. This means that even if possible, not very many people in this country can afford to go to heaven by such man-made devices.

Space Travel Is Time-consuming—

Not only does it take years of development to make space travel possible, but it takes time to get from one heavenly body to another because of the tremendous distances separating them.

The top speed of a modern commercial jet is about 700 miles an hour. Therefore 10,000 miles an hour is quite fast by comparison. But at 10,000 miles an hour a space ship would take one day to reach the moon, one year to the sun, 40 years to Pluto, the farthest planet in our solar system, and 270,000 years to Alpha Centauri, the nearest star. Thus going to heaven, somewhere outside the solar system, is indeed a hopeless dream.

GOD'S WAY OF GOING TO HEAVEN

As far as we know, there were only four persons the Bible mentioned by name who have gone to heaven from this earth. The first was Enoch.

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Genesis 5:24 states, "And Enoch walked with God: and he was not; for God took him." When God took him, he was 365 years old (Genesis 5:23).

The next was Moses. His demise at age 120, and subsequent burial, are recorded in Deuteronomy 34:5-7. Thereafter he was translated, for when Jesus and His disciples went to the mount of transfiguration, he and Elijah were there talking to Jesus (Matthew 17:1-4).

The manner of Elijah's going to heaven was recorded in 2 Kings 2:1, 11. It states, ". . . Elijah went up by a whirlwind into heaven."

Ellen G. White stresses the significance of the presence of Moses and Elijah at Jesus' transfiguration thus: "Moses upon the mount of transfiguration was a witness to Christ's victory over sin and death. He represented those who shall come forth from the grave at the resurrection of the just. Elijah, who had been translated to heaven without seeing death, represented those who will be 'changed in a moment, in the twinkling of an eye, at the last trump' when 'this mortal must put on immortality,' and 'this corruptible must put on incorruption.'" — *The Desire of Ages*, pp. 421, 422.

The last was Jesus. His ascension was described in Acts 1:9-11 which says, "And when he (Jesus) had spoken these things, while they beheld, he was taken up; and a cloud received him out of their sight. And while they looked steadfastly toward heaven as

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he went up, behold, two men stood by them in white apparel; Which also said, Ye man of Galilee, why stand ye gazing up into heaven? this same Jesus, which is taken up from you into heaven, shall so come in like manner as ye have seen him go into heaven."

Some may ask why Mary, the mother of Jesus, was not mentioned. It is true that according to the Catholics, Mary is in heaven, but there is absolutely no Biblical basis for this belief. Nowhere in the Bible is there the slightest mention or implication that Mary ever went to heaven. As far as the author is concerned, Mary, like all other women of the Bible, is still waiting for the resurrection at the second coming of Christ. However, because of her saintly life, she will undoubtedly be saved and taken to heaven. To be the mother of the Saviour of the world earned her no special favor or merit as far as salvation is concerned.

The Bible tells us that all the righteous will go to heaven, not when they die, as some churches teach, but when Jesus comes to claim His own. Since no mortal being, even the righteous, can go to heaven God's way, the first necessary step is to put on immortality as we are assured in 1 Corinthians 15:51-53. Philippians 3:21 makes it even more plain. Putting on immortality means to ". . . change our vile body, that it may be fashioned like unto his glorious body." Not until we have gone through such

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a process shall we be able to go to heaven in the manner described in 1 Thessalonians 4:16, 17: "For the Lord himself shall descend from heaven with a shout, with the voice of the archangel, and with the trump of God: and the dead in Christ shall rise first: Then we which are alive and remain shall be caught up together with them in the clouds, to meet the Lord in the air: and so shall we ever be with the Lord."

How easy! No need of 200-foot rockets, no need of clumsy space suits or oxygen tanks. No need of being protected by heavy, thick radiation-shielding material, or carrying food supplies in collapsible tubes like tooth paste, relying upon algae to convert carbon dioxide and moisture of our breath into carbohydrates and oxygen would be unnecessary, and carrying a specially designed distillation apparatus to recover the precious water from our urine would just be an opus.

What is the cost? Absolutely nothing! In Romans 5:18, Paul tells us that it is gratis. "Therefore as by the offence of one judgment came upon all men to condemnation; even so by the righteousness of one the free gift came upon all men unto justification of life."

How can we obtain this gift? Simply by having faith in Jesus Christ. John 3:16 states, "For God so loved the world, that he gave his only begotten

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Son, that whosoever believeth in him should not perish, but have everlasting life.”

The heaven to which the redeemed will go is where God’s dwelling place is (Revelation 20 and 21). As we indicated in a previous chapter, God’s dwelling place is in the neighborhood of Orion, which is 2,400,000,000 times the distance between this earth and the sun. In other words, Orion is 2,400,000,000 times 93,000,000 miles away. If this 223,200,000,000,000-mile trip were made by light, which travels at the incredible speed of 186,000 miles per second, it would take 34,246 years. Yet, according to Ellen G. White, this trip will take only seven days.¹ Thus we see that space travel God’s way is not time-consuming. The same author informs us that the redeemed and the 144,000 (Revelation 14:3, 4) will also be privileged to visit the other worlds.²

1. Ellen G. White, *Early Writings*, p. 16.

2. *Ibid.*, p. 40.

Chapter 4

LIFE ON THIS EARTH AND OTHER PLANETS

ORIGIN OF LIFE

LIFE originated with God at the time of creation, according to the first chapter of Genesis. Because life begets life, only a living God could create life. If life could come from the nonliving, it would be equal to "getting something out of nothing."

However, in spite of this simple truth, there are scientists who would go through the most unscientific reasoning process to account for the origin of life. The following statement, made by Professor George Wald of Harvard, is typical:

"The important point is that since the origin of life belongs in the category of at-least-once phenomena, time is on its side. However improbable we regard this event, or any of the steps which it

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involves, given enough time it will almost certainly happen at least once. And for life as we know it, with its capacity for growth and reproduction, once may be enough.

"Time is in fact the hero of the plot. The time with which we have to deal is of the order of two billion years. What we regard as impossible on the bases of human experience is meaningless here. Given so much time, 'the impossible' becomes possible, the possible probable, and the probable virtually certain. One has only to wait: time itself performs the miracle."—*Scientific American*, August, 1954, p. 48.

The improbability of Professor Wald's "probability" is pointed out by Dr. Frank Allen, who said: "Proteins are the essential constituents of all living cells, and they consist of five elements, carbon, hydrogen, nitrogen, oxygen and sulphur with possibly forty thousand atoms in the ponderous molecule. As there are ninety-two chemical elements (103 now) in nature, all distributed at random, the chance that these five elements may come together to form the molecule, the quantity of matter that must be continually shaken up, and the length of time necessary to finish the task can all be calculated. A Swiss mathematician, Charles Eugene Guye, has made the computation and finds that the odds against such an occurrence are 10^{160} to 1, or only one chance in 10^{160} , that is 10 multiplied by

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itself 160 times, a number far too large to be expressed in words or figures that have comprehensible meaning. The amount of matter to be shaken together to produce a single molecule of protein would be millions of times greater than that in the whole universe. For it to occur on the earth alone would require many, almost endless billions (10^{243}) of years. Proteins are made from long chains called amino acids. The way these are put together matters enormously. If in the wrong way, they will not sustain life and may be poisons. Professor J. B. Leathes (England) has calculated that the links in the chain of quite a simple protein could be put together in millions of ways (10^{48}). It is impossible for all these chances to have coincided to build one molecule of protein. But proteins as chemicals are without life. It is only when the mysterious life comes into them that they live. Only Infinite Mind, that is God, could have foreseen that such a molecule could be the abode of life, could have constructed it, and made it live."¹

Paul Heubach used a more common illustration to show the improbability of Professor Wald's statement. He said: "Throw some flour, water, sugar, salt, shortening, eggs, nuts, cherries, apples, a pumpkin, dates and raisins, spices, et cetera, into a revolving oven and take out a cherry pie, an apple

1. Frank Allen, "The Origin of the World—By Chance or Design," in *The Evidence of God in an Expanding Universe*, ed. by John C. Monsma, pp. 23, 24, G. P. Putnam's Sons, 1958.

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pie, a pumpkin pie, a spongecake, a fruitcake, two loaves of whole-wheat bread, two loaves of white bread, two dozen applesauce doughnuts, and a gluten roast, and you have a demonstration of the possibility of pure chance accounting for our universe."—*Review and Herald*, Feb. 4, 1960, p. 9.

Professor Edwin G. Conklin, noted American biologist and author of many important works on biology, has often said, "The probability of life originating from accident is comparable to the probability of the Unabridged Dictionary resulting from an explosion in a printing shop."

LIFE ON THE PLANETS OF THE SOLAR SYSTEM

According to Sir Harold Spencer Jones, the author of *Life on Other Worlds*, in order to have life on a planet, the following conditions are necessary:

1. The temperature on the surface of the planet should be neither too high nor too low. If the planetary temperature is higher than 147° F., the temperature used by dairy people for pasteurizing milk, life can hardly be expected to be found there. If the temperature of the planet is too low, even though life is not actually destroyed, there will be a state of suspended animation; therefore development of life will be extremely improbable. The

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temperature of the planet is chiefly determined by its distance from the sun.

2. There should be present an atmosphere dense enough to provide sufficient amounts of oxygen and carbon dioxide to maintain life processes of the animals and plants.

Whether a planet is capable of holding an atmosphere depends on the ratio of what is known as the escape velocity of that planet and the average molecular velocity of the gases composing its atmosphere. Without going into detailed calculation, we may simply say that the larger the planet, the greater its gravitational attraction will be, and consequently its atmosphere will be more extensive. The smaller the planet, the thinner will be its atmosphere, which may even be totally absent.

With these criteria and with the aid of the following table, let us examine all the planets of the solar system as well as the moon to see if life is possible on any of them.

Planet	Distance from sun in millions of miles	Mass (Earth = 1)	Diameter in miles
Mercury	36.00	0.044	3,100
Venus	67.27	0.82	7,700
Earth	93.00	1.00	7,927
Mars	141.71	0.108	4,200
Jupiter	483.88	317.1	88,700
Saturn	887.14	94.9	75,100
Uranus	1,783.98	14.65	32,000
Neptune	2,795.46	17.16	27,700
Pluto	3,675.27	0.01	3,600

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Because of its proximity to the sun, Mercury has a temperature higher than 400°C . Life as we know it at such high temperature is impossible.

The moon, because of its small size, has no atmosphere. There are many evidences showing that the moon has neither atmosphere nor water. Hence, there can be no life on the moon.

Owing to their large size, there are extensive atmospheres on the so-called giant planets, Jupiter, Saturn, Uranus, and Neptune. But because of their great distances from the sun, the temperatures on these four planets as well as on Pluto are very low. The surface temperature of Jupiter is about -140°C ., Saturn -155°C ., Uranus below -180°C ., Neptune and Pluto still colder. Life on these planets is out of the question.

There remains two other planets which are neighbors to the earth one closer to the sun and one farther from the sun than the earth is. They are Venus and Mars. We shall discuss the possibility of life on these planets more in detail separately.

Venus, the most brilliant planet in the solar system, has been called the twin sister of the earth because of its close resemblance in size and weight. It has an extensive atmosphere since sunlight passing through such, forms a hazy halo around it. This haze is believed to be due to an unbroken layer of clouds. The permanent presence of this cloud

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layer has prevented scientists from learning the surface nature of the planet below.

The spectroscopic analysis of the atmosphere of Venus presents certain difficulties because elements in the earth's own atmosphere confuse and distort data. Up to December, 1959, the only thing known to be present in the atmosphere of Venus was carbon dioxide. Since carbon dioxide is a great heat absorber, the planet under the cloud blanket must be desert-dry and hot. However, if water were present, some form of life on Venus might be possible.

To discover whether water is present on Venus by spectroscopic analysis, it is necessary to carry out the experiment above the earth's water-laden atmosphere. A balloon-borne expedition designed for such an experiment was launched in Rapid City, South Dakota, on a December, 1959, morning by Navy Commander Malcolm D. Ross and physicist Charles Moore. The balloon rose to a maximum altitude of 81,000 feet. In spite of some mishaps, the researchers were able to focus their telescope in the gondola on Venus for 10 minutes and record spectroscopic data, which indicated the presence of water vapor in the atmosphere of Venus and possible existence of life on the planet.

However, a radio telescope, with which light-obstructing clouds could not interfere, observed the hard surface of Venus and found it has a very high temperature of 585° F. Since no liquid water can

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exist on the surface of Venus at such high temperature, life on Venus is unlikely.

Mars is perhaps more like the earth than any other planet. It more or less meets the conditions given by Sir Harold Spencer Jones for the existence of life. Being a close neighbor of the earth and only slightly farther away from the sun, it has a temperature only slightly lower than that on the earth, but not extremely cold so that life is not impossible. The maximum surface temperature during the day is believed to be around 20° C., but it is much colder at night.

Also it has an atmosphere, though it is more tenuous and less extensive than the atmosphere on the earth on account of its smaller size and mass. It is believed there is less oxygen and less water in the atmosphere of Mars than of the earth.

The surface of Mars is more easily observed than any other planet. Even though its main surface is reddish, its polar regions are white. These so-called polar caps vary in size from season to season. They are believed to be regions of ice or snow, which increase during the winter and melt away during the summer.

Besides polar caps, there are many dark lines, which are called "Schiaparelli's Canals." Many years ago astronomer Percival Lowell believed these lines were strips of vegetation along the banks of canals and that they proved the existence of in-

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telligent beings on Mars, which we call "Martians" or "Men from Mars."

While the existence of some form of plant life is conceded, the existence of intelligent animal life is denied by most modern astronomers. They say the so-called canals are nothing but natural features, such as rivers.

Thus we see that our search for intelligent beings like man or even higher animals on the moon or other planets of the solar system ended in failure. So our next question is: "Are there intelligent beings on other worlds outside the solar system?"

INTELLIGENT BEINGS ON OTHER WORLDS

Now that there is a possibility for man to leave the earth and go to other planets, perhaps even beyond the solar system, he asks the paramount question: "Are there intelligent beings on other worlds?"

Those who are versed in the Bible know that the Bible answered this question affirmatively long ago. In Job 38:4-7 we read: "Where wast thou when I laid the foundations of the Earth? declare, if thou hast understanding. Who hath laid the measures thereof, if thou knowest? or who hath stretched the line upon it? Whereupon are the foundations thereof fastened? or who laid the corner stone thereof; When the morning stars sang together, and all the sons of God shouted for joy?" Since Adam

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was the son of God on this earth (Luke 3:38), other sons of God that rejoiced at the creation of this earth must be other Adams of other worlds. (See also Job 1:6, 7; 2:1, 2).

In Isaiah 40:15 we read: "Behold, the nations are as a drop of a bucket, and are counted as the small dust of the balance." This verse implies that the nations of this earth are as a drop compared with myriads of nations on all the other God-created worlds in the universe.

A more direct and undisputable statement to the effect that there are people dwelling on other worlds is found in Revelation 12:12, which reads: "Therefore, rejoice, ye heavens, and ye that dwell in them. Woe to the inhabitants of the earth and of the sea!" (See also Ephesians 3:14, 15; Nehemiah 9:6).

Now that we have examined the clear statements of God's Holy Writ on the question, let us see what scientists think regarding the possibility of there being intelligent beings on other worlds.

Dr. Shapley of Harvard estimates that within the relatively narrow limits of our present optical telescopic reach of two billion light-years there are perhaps more than 100 billion billion stars; about 10 per cent of the stars, he says, are essentially identical with our own sun in size, luminosity, and chemistry. They all radiate the kind of energy needed to sustain animal and plant metabolism.

According to George Wald, "It is conservatively

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estimated that at least 100,000 planets like the earth exist in our galaxy alone. Some 100 million galaxies lie within the range of our most powerful telescope, so that throughout observable space we can count apparently on the existence of at least 10 million million planets like our own.”—*Scientific American*, August, 1954, p. 53.

The popular science writer Willy Ley has this to say: “In our own solar system two planets are known to bear life, namely Earth and Mars, but we’ll assume that only one planet out of every hundred planets does bear life. This still means 100 million life-bearing planets in our galaxy. Now we’ll say that only one out of a hundred of those that bear life provides the conditions that produce intelligent life. This makes a round even million planets with intelligent life.”—*Satellites, Rockets, and Outer Space*, p. 126.

Sir Harold Spencer Jones makes a slightly more conservative estimate. He says: “If the proportion of planets on which life can exist is not more than one in a thousand, or even one in a million, the total number of worlds that are suitable for life would yet be considerable, so vast is the scale on which the universe is constructed.”—*Life on Other Worlds*, p. 152.

Dr. Su-shu Huang, a physicist with the National Aeronautics and Space Administration, has worked out a formula—taking into consideration the size,

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temperature, and age of the star—that indicates where the possibilities of intelligent life are most likely. In an article in the *Scientific Monthly*, he named the stars Epsilon Eridani (10.8 light-years away) and Tau Ceti (11.8 light-years away) as examples of suns around which planetary life can flourish; he concluded his article by saying: "Thus it seems that intelligent life may be scattered throughout the Milky Way and universe as a whole."—April, 1960 issue, p. 55.

Dr. Frank D. Drake of the National Radio Astronomy Observatory at Green Bank, West Virginia, has actually launched Project Ozma for detecting radio signals that might be transmitted by living beings on other planets. He and his associates are now pointing their 85-foot radio telescope toward Epsilon Eridani and Tau Ceti for radio signals. For this purpose, they are utilizing 21-centimeter waves (1,420 megacycles), the sharpest and most universal radio waves that flash through space.

Since this earth is the only planet that has sinned and civilization on this earth is of short duration, it is reasonable to believe that inhabitants of other worlds are more intelligent and their civilizations more advanced. A group of scientists have voiced their opinions to this effect. *Life* says the group working on Project Ozma "believe that life may exist in other solar systems—and in societies far more advanced than ours."

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Science News Letter (June 18, 1960) quotes Dr. Freeman J. Dyson of the Institute for Advanced Study, Princeton, N. J., as saying that "other civilizations may be millions of years ahead of the earth."

Thus we see the agreement between science and divine inspiration.

Chapter 5

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OF GOD

AFTER HIS KIND

IN GENESIS 1:20-25 we read "And God said, Let the waters bring forth abundantly the moving creature that hath life, and fowl that may fly above the earth in the open firmament of heaven.

"And God created great whales, and every living creature that moveth, which the waters brought forth abundantly, *after their kind*, and every winged fowl *after his kind*: and God saw that it was good.

"And God blessed them, saying, Be fruitful, and multiply, and fill the waters in the seas, and let fowl multiply in the earth.

"And the evening and the morning were the fifth day.

"And God said, Let the earth bring forth the liv-

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ing creature *after his kind*, cattle, and creeping thing, and beast of the earth *after his kind*: and it was so.

“And God made the beast of the earth *after his kind*, and cattle *after their kind*, and every thing that creepeth upon the earth *after his kind*: and God saw that it was good.”

As a corollary to this command of God to every living thing to multiply after his kind are the following texts:

“Can the Ethiopian change his skin, or the leopard his spots?” (Jeremiah 13:23).

“Do men gather grapes of thorns, or figs of thistles?” (Matthew 7:16).

“Whatsoever a man soweth, that shall he also reap” (Galatians 6:7).

For nearly six thousand years, the mechanism by which living things carry out God’s command to multiply after their kind has remained a deep mystery; it has not been discovered until recently.

As we shall see presently, the work of multiplying “after his kind” was committed to the genes, the fundamental units of heredity. From Snyder and David’s *The Principles of Heredity*, pages 367, 368, we quote:

“At each mitosis every gene reproduces itself. The manner of this self-propagation is clearly one of the fundamental problems of genetics, but as yet relatively little progress has been made toward its

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solution. It is now agreed that a gene duplicates itself not by growing and splitting but by building alongside itself a duplicate of itself. Moreover, when a gene mutates, it will build a copy of the new mutated form just as faithfully as it formerly copied the original form.

"This unique ability of a gene to draw from the surrounding medium the various building blocks needed to duplicate itself and to impress upon them its own pattern, even when that pattern is a changed, or mutated pattern, is at the very center of the processes of life. The necessary building blocks for the formation of nucleo-proteins are amino acids, purines, pyrimidines, and phosphates. It has been suggested that each chemical unit of a gene, such as a side chain or radical attracts to itself a similar but uncombined unit available in the surrounding medium, and that these are held together in position against the gene while chemical union between the parts take place, thus creating a replica of the gene. The problems of gene duplication are among the most challenging of those facing geneticists at the present time and will require the aid of biochemists and physicists for their complete solution."

The 1959 Nobel Prize in medicine was shared by Dr. Kornberg of Stanford University for his discoveries of the mechanism in the biosynthesis of deoxy-nucleic acids of DNA, and by Dr. Ochoa of New York University for his discoveries of the mecha-

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nism in the biosynthesis of deoxynucleic acids or DNA, and by Dr. Ochoa of New York University for his discoveries of the mechanism in the biosynthesis of ribonucleic acids of RNA. Dr. Kornberg's synthesis of these fundamental units of genes is briefly described in the *Chemical and Engineering News* for October 26, 1959, pages 19, 20, as follows:

"Dr. Kornberg and his coworkers (particularly Dr. I. R. Lehman, Dr. M. J. Bessman, and Dr. Julius Adler) start their synthesis with the monophosphates of naturally occurring deoxynucleosides. These are obtained by the degradation of DNA. They then convert these monophosphates to triphosphates either chemically or enzymatically.

"The key step in the synthesis takes place in phosphate buffer at a neutral pH. Dr. Kornberg places the four substances and a small amount of natural DNA to act as a 'template' in the buffer and adds an enzyme—polymerase—which he extracts from *E. Coli*. The four deoxyribonucleoside-5'-triphosphates are assembled in a chain through the catalytic action of the polymerase. And the natural DNA present guides the polymerization process so that the nucleosides are in the same order in the new molecules as in the template.

"The DNA thus produced appears to be identical in every way with the natural material.

"In the original work, Dr. Kornberg's group was able to convert about half of the substrate material to

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DNA. They have also made several different kinds of DNA by using different templates."

Time explains the process in more common language this way: "When the DNA home cell begins to divide, its complicated molecules, originally like two ropes twisted together, untwist and separate. Each rope attracts bits and pieces from fluid around it and forms a new double helix like the original one. Apportioned between the halves of the dividing cells, the duplicated DNA molecules determine whether the new individuals will be men or muskrats, pine trees or pineapples. The hereditary characteristics of the next generation—of about three billion people—will be controlled by one-fifteen-thousandth of a cubic inch of DNA" (May 2, 1960, p. 39).

How true is the apt saying of Dr. Alfred E. Mirsky of the Rockefeller Institute for Medical Research that "Our ancestors are present in our chromosomes."

Thus we see here another example of the substantiation of Biblical truth by the discoveries of modern science. The intelligent way the genes carry out God's command truly testifies to a great, intelligent being who created them.

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GENE MUTATION NO PROOF FOR EVOLUTION

As we have stated, when a gene mutates, it will build a copy of the new mutated form just as faithfully as it formerly copies the original form. Some scientists have used this as supporting evidence for evolution. In fact, Christian Anfinsen's book, *Molecular Basis of Evolution*, is based on this whole idea. However, chromosome and gene mutations do not prove evolution, as pointed out by the following scientists.

Dr. Walter E. Lammerts, formerly of University of California and now a plant breeding specialist, stated his view as follows:

"The end point of variability in any plant or animal is soon reached by selective breeding. Self-pollination in plants or inbreeding in animals results in far less vigorous lines. Except for occasional mutations (changes), such lines breed true and do not continue to vary in all possible directions as postulated by Darwin. The occurrence of occasional mutations in them is, however, eagerly pointed to by evolutionists as the material basis of evolution. But are they really? Long continued study of them in many organisms, but especially in the fruit fly, *Drosophila melanogaster*, indicates that most mutations are lethal. Among the non-lethal ones the majority are defective changes, or at

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least neutral ones, which have associated physiological effects that decrease the general ruggedness of the individual. Therefore, an accumulation of such heritable mutations would hardly give us the sort of changes needed for species formation.”¹

Dr. Gerald T. Den Hartog, research agronomist of the U. S. Department of Agriculture, wrote in the same book:

“It is true, mutations (alterations) occur in plant life, though with extreme infrequency—chromosomal mutations and gene mutations. But also these leave the species itself intact. Chromosomal mutations involve the loss of an entire chromosome or the deletion, inversion, or translocation of a chromosome segment. Gene mutations also occur. Such mutations, involving a single locus, have been studied on a large number of organisms. By the use of X-rays and mutator genes Muller studied the equivalent of some 1,000 or more generations of the fruit fly, *Drosophila melanogaster*, and reports that the mutated genes are all deleterious or at best similar in effect to the original gene complex. Stadler obtained similar results from his X-ray studies of barley seeds. All these and similar studies indicated that there was no change in the species.”²

1. Walter E. Lammerts, “Things a Fruit Rancher's Boy Learned,” in *The Evidence of God in an Expanding Universe*, ed. by John C. Monsma, p. 117, G. P. Putnam's Sons, 1958.

2. Gerald T. Den Hartog, “Footsteps of God in the Plant World,” in *The Evidence of God in an Expanding Universe*, ed. by John C. Monsma, pp. 103, 104, G. P. Putnam's Sons, 1958.

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IN HIS IMAGE

What applies to the physical also applies to the spiritual, although the latter cannot be demonstrated by science. It is hoped, however, that the foregoing discussion has built a sufficient foundation for the reader to better understand this topic of a more spiritual nature.

In Genesis 1:26, 27, we read: "And God said, Let us make man in our image, after our likeness . . . So God created man in his own image, in the image of God created he him."

Since in a previous chapter we have shown that God is a person, having eyes, ears, hands and feet, there must be some resemblance between man's physical body and that of God. When "Philip saith to him, Lord, Shew us the Father . . . Jesus saith unto him, Have I been so long time with you, and yet hast thou not known me, Philip? he that hath seen me hath seen the Father; and how sayest thou then, Shew us the Father?" (John 14:8, 9). Did not Paul also say that Jesus was the express image of the Father? (Hebrews 1:3). Both Colossians 1:16 and John 1:3 tell us that Jesus was the creator of all things, so that when Genesis 1:26 says "Let us make man in our image," it means that man was created in the image of both God and Jesus, and that there is physical resemblance between man and God.

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However, this likeness was much more than physical likeness. This point has been emphasized by a number of prominent religious writers:

"Created to be 'the image and glory of God,' Adam and Eve . . . bore in outward resemblance the likeness of their Maker. Nor was this likeness manifest in the physical nature only. Every faculty of mind and soul reflected the Creator's glory."—Ellen G. White, *Education*, p. 20.

"As respects man's nature, the resemblance to God cannot be looked for, as just said, in his body, nor in the animal functions of his soul. It must be looked for, therefore, in that higher constitution of his being which makes him spiritual. It is in the powers and activities of man as a personal spirit that we are to see his affinity to God and resemblance to Him. The image of God intended in Scripture, in other words, is a mental and moral image. It is to be sought for in the fact that man is a person—a spiritual, self-conscious being; and in the attributes of that personality; his rationality and capacity for moral life, including in the latter knowledge of moral law, self-determining freedom and social affection; highest of all, his capacity for fellowship with God."—James Orr, *God's Image in Man*, pp. 56, 57.

"According to the Reformed theologians and the majority of the theologians of other divisions of the Church, man's likeness to God included the follow-

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ing points: his intellectual and moral nature. God is a spirit, the human soul is a spirit. The essential attributes of a spirit are reason, conscience, and will. A spirit is a rational, moral, and therefore also, a free agent. In making man after his own image, therefore, God endowed him with those attributes which belong to his own nature as a spirit. Man is thereby distinguished from all other inhabitants of this world, and raised immeasurably above them."—Charles Hodge, quoted in *Christianity Today*, Vol. IV, No. 3, p. 24.

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After the entrance of sin had marred the image of God in man, heaven instituted the plan of redemption to restore that image. This is clarified by the following quotations:

"But by disobedience this was forfeited. Through sin the divine likeness was marred, and well-nigh obliterated. Man's physical powers were weakened, his mental capacity was lessened, his spiritual vision dimmed. He had become subject to death. Yet the race was not left without hope. By infinite love and mercy the plan of salvation had been devised, and a life of probation was granted. To restore in man the image of his Maker, to bring him back to the perfection in which he was created, to promote the development of body,

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mind, and soul, that the divine purpose in his creation might be realized,—this was to be the work of redemption.”—Ellen G. White, *Education*, pp. 15, 16.

“The possibility of redemption after man had sinned is as great a mark as any of the image of God impressed upon him. When man has fallen he is not left to himself, as one whose fall is a trifling matter in the great economy of God’s creation. It was because His own image had been impressed on man that God undertook to redeem him; it was because that image, though defaced, had not been wholly destroyed, that such redemption was possible.”—James Hastings, quoted in *Christianity Today*, Vol. IV, No. 3, p. 24.

“Since human nature was originally constituted in the divine image, it was perfectly congruous for the divine person of the Son of God to assume, and identifying Himself with, human nature, in order to be able to take man’s place under the law of eternal justice. Thus redemption was anticipated in the creation of man in the divine likeness.”—Leander S. Keyes, *The Philosophy of Christianity*, p. 127.

The marring of the image of God is like mutation of the genes mentioned previously in this chapter, and the restoring of the image of God is mutation in reverse going back to the original normal condition.

Restoration of God’s image in man is possible be-

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cause some of the spiritual attributes with which man was endowed at creation have not been entirely lost, so that under favorable conditions they may, by spiritual growth, be restored to the original state. This same idea was expressed by Herman Bavinck when he said: "Man is a creature who, right from the beginning, was created after God's image and likeness, and this Divine origin and Divine kinship he can never erase or destroy. Even though he has, because of sin, lost the glorious attributes of knowledge, righteousness, and holiness which lay contained in that image of God, nevertheless there are still present in him 'small remains' of the endowments granted him at creation; and these are enough not merely to constitute him guilty but also to testify of his former grandeur and to remind him continually of his Divine calling and heavenly destiny."—Quoted in *Christianity Today*, Vol. IV, No. 3, p. 24.

Thus we see the great difference between "after his kind" and "in His image." "After his kind" applies to the physical and the biological, while "in His image" applies more to the moral and the spiritual. There is nothing that a plant or an animal can do about its growth or maintenance. Ordinarily a red rose will produce a red rose; a black leopard will produce a black leopard. A salmon by biological instinct will swim up stream against all obstacles for hundreds of miles to the spawning ground where he was born, to spawn and die. Very

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seldom are radical changes brought about by mutation, such as a normal cow giving birth to a two-headed calf, or normal-sized parents giving birth to a boy or girl who grows up to an eight-foot giant or a three-foot dwarf. These freaks are usually found in circuses as oddities.

But when God created man in His own image, He gave him the power of choice; thus man is a free moral agent. He can do whatever he pleases—good or evil. He can serve God or he can serve the devil. Because it is easier to sin than to live a good life, the majority of the human race have deviated from the original pattern or image of God. It was for the purpose of restoring that image that Jesus came to die on Calvary's cross, to give man a stronger power to do good, and to reverse the mutative process so that man might experience his former perfect condition. Quite often this process of restoring God's image affects an individual suddenly; we call it conversion. We find such examples in the prodigal son, the thief on the cross, and the thousands converted to God at revival meetings and crusades; by the choice of their will spontaneously quitting drink, smoke, theft, etc., they thereafter lived a victorious, vibrant life.

Unfortunately, scientists cannot reveal the image of God as they can chromosomes, genes, nucleic acids, RNA's and DNA's. Neither can the author explain it in terms of science. It is inexplicable.

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The most he could do would be to discuss a physical phenomenon that bears closer resemblance. This he will do presently.

THE FORMATION OF CRYSTALS

Those who have been to a natural history museum have admired the beautiful crystals of various minerals. Some are in the form of cubes, others in hexagons, still others in the rather slender form known as the monoclinic. With few exceptions, scientists have found that one kind of mineral always crystallizes in one form, and another kind in another form. That is one property by which different types of minerals may be recognized.

The process of crystal formation, in certain respects, resembles the way plants and animals grow—by duplication of its own kind. For instance, if one prepares a saturated solution of photographer's hypo by stirring into very hot water hypo crystals until there are a few crystals remaining that will no longer dissolve, and then he allows this solution to cool, he will notice forming around the old crystals new crystals of the same kind. Even though here the molecules are inorganic and lifeless, and there are no genes or DNA's, the process of duplication by copying what is already present is similar to gene duplication.

But crystal formation is not always the result of

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duplicating what is already present. New crystals can form where there were none to copy. For example, after one has made a saturated solution of hypo, he pours the clear top solution into another container to separate this part from the remaining solution containing the undissolved crystals. Now if this solution just poured out is allowed to cool and evaporate, eventually crystals will form in spite of the fact that there were no crystals there to act as a template. Somehow the dissolved hypo molecules knew what form they were supposed to be crystallized in, as if the molecules had been stamped with that image, so that when conditions were satisfactory, the molecules arranged themselves according to the image with which they had been stamped.

Man is like mineral and chemical compounds. It is very difficult to demonstrate the presence of God's image in the lives of vile criminals. Yet, when they are allowed to cool down and their wicked thoughts evaporate in the prison cells in which they are immured, sometimes the image of God, with which they were stamped, gradually takes shape and their lives eventually crystallize into characters of beauty. One outstanding example is told in a book entitled: *Harry Orchard—The Man God Made Again*, an autobiographical story of one of the most notorious criminals of the early 20th century. In spite of the fact that Orchard, employed by the radical Western Federation of Min-

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ers, dynamited and burned mines and mills and a train depot and murdered more than a score of men including the former governor of Idaho, Frank Steunenberg, and regarded himself a "devil incarnate," he was not forsaken by God.

He said as he was seriously thinking in his cell in the Boise, Idaho, penitentiary, "finally my thoughts took another turn and reached back to my childhood days—to my dear mother, to my wife and little girl whom I had so grievously wronged. Then conviction and remorse began to take hold of me. I endeavored with all my strength to shake these feelings off and to put on the same old bold front. But they refused to be shaken. And after several weeks of fierce struggle I yielded to conviction. To make a long story short, I fully made up my mind to make a full confession of my awful life of sin and crime."—page 196.

After his confession, he diligently asked God for forgiveness. Then through reading the little Bible sent to him by a mission society in Chicago and other religious books sent to him by Mrs. Steunenberg, the wife of the man he assassinated, he became an ardent Christian and enjoyed peaceful communion with his Lord. For over forty years during which he served his life sentence, he had the respect and confidence of the wardens and the governor.

Speaking of Orchard's relationship with his God, LeRoy E. Froom, who collaborated with Orchard

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in writing his autobiography, wrote: "It was a deep, abiding, increasing fellowship that has grown closer and brighter with the march of the years. It is my honest conviction that Orchard is truly one of the greatest living examples of God's regenerating, transforming grace and His enabling and keeping power in all modern times. He has been introvertibly changed from a most notorious criminal to one of the sweetest, kindest, most Christian characters that live—from a destroying devil to a veritable saint. His life is truly a modern miracle . . . Orchard is a man that God has assuredly made over again."—pages 175, 176.

Sometimes changes in one's life come slowly as in the example just cited. It is like a saturated solution without undissolved crystals present; crystallization may not occur until after many weeks or months. Likewise, it may take years before a criminal realizes his sinful condition and surrenders his life to God.

On the other hand, changes in a person's life may come rather quickly. It is like a saturated solution becoming supersaturated through cooling and evaporation, and it still refuses to crystallize when left to its own accord. However, when a small crystal of its own kind is dropped into such a solution, crystallization may begin immediately. There are fewer beautiful sights to behold than watching the crystallization of a supersaturated solution, to see the most

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beautiful and enchanting geometrical figures forming in quick succession out of a clear, limpid solution. This process of inducing crystallization by introducing a tiny crystal of its own kind is known as "seeding." It is very much like hardened criminals who refuse to surrender their lives to Christ until one day a seed of the word of God finds lodgment in their hearts and conversion takes place instantly; from then on the image of God in their lives cannot be denied, even by an atheist.

Scientists may tell you that the process of crystal formation is easily explained in terms of covalent and hydrogen bonding, van der Waal and Coulomb forces that are within the atoms and molecules making up the crystals. Such terms may be used to explain substances that crystallize in one, or, at the most, two or three different forms. However, when dealing with ice crystals in snow, whose designs are infinite, the scientist is really baffled. Wilson Bentley, the author of *Snow Crystals*, devoted his lifetime to the study of snow and photographed snow in his lonely New England mountain retreat for more than 45 years. Out of his 5,300 pictures of snow crystals, he was unable to find two identical shapes. It is reliably stated that no two snow flakes have been found to be exactly alike. This means that of the billions and trillions of snow flakes that fall on the ground each year all are different. Yet, water, from which snow is formed, is

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one of the simplest of all chemical compounds. It consists of only one atom of oxygen and two atoms of hydrogen. Now what great scientist with a finite mind can explain these infinite varieties of snow crystals? Can it be that God, who loves beauty and variety, has stamped, as it were, on the countless water molecules myriads of different images, so that when they form shimmering ice crystals called snow, the resulting flakes will be all different?

Chapter 6

DIVINE NATURE IN MAN

WHEN GOD created man, He created him in His own image. As we have indicated in the previous chapter, the word "image" does not merely signify physical resemblance. It comprehends moral, spiritual, and other divine characteristics as well.

By sinning, man lost many of the divine qualities which he originally possessed. For example, he was created an immortal being like his maker, but through transgression he became a mortal being, subject to death. However, because of Jesus' sacrifice on Calvary's cross, provision was made for this lost divine nature to be eventually restored. As we shall show presently, as man accepts God's sacrifice for his sin not only will all his lost divine characteristics be restored, but he will also be given other divine attributes which he never possessed before his fall.

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It is obvious that in a short chapter we cannot discuss all the characteristics of the divine nature in man. Therefore we shall limit our discussion to those attributes of the divine nature that may be better understood in the light of modern science.

SUPERIOR SENSES

Most people are aware of the five senses—sight, hearing, smell, taste, and touch. But scientists have found that we have other kinds of sense experience, such as sensitivity to heat and cold, pressure, pain, tickling, and equilibrium.

When man was first created, his senses were keen and sharp. One religious writer stated that Adam's senses were seven times as keen as ours. But after sin entered this world, man became increasingly dull and insensitive. Take hearing for example; man can hear sounds that range in loudness from about one decibel to 120 decibels and in pitch from twenty vibrations per second to 20,000 vibrations per second. Sounds lower and higher than these limits man cannot hear. Yet some animals can hear sound that human beings cannot. For example, cockroaches and grasshoppers are sensitive to low sounds. Bats can hear sound waves pitched as high as 55,000 vibrations per second. The Bible records incidents in which people who were close to the Lord had a keener sense of hearing

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than others. Thus, while Samuel heard the Lord calling him four times and understood all the Lord told him, Eli nearby did not hear a word. The interesting story is recorded in 1 Samuel 3:3-17:

“Samuel was laid down to sleep . . . the Lord called Samuel: and he answered, Here am I. And he ran unto Eli, and said, Here am I; for thou calledst me. And he said, I called not; lie down again. And he went and lay down. And the Lord called yet again, Samuel. And Samuel arose and went to Eli, and said, Here am I; for thou didst call me. And he answered, I called not, my son; lie down again. . . . And the Lord called Samuel again the third time. And he arose and went to Eli, and said, Here am I; for thou didst call me. And Eli perceived that the Lord had called the child. Therefore Eli said unto Samuel, Go, lie down: and it shall be, if he call thee, that thou shalt say, Speak, Lord; for thy servant heareth. So Samuel went and lay down in his place. And the Lord came, and stood, and called as other times, Samuel, Samuel. Then Samuel answered, Speak; for thy servant heareth. And the Lord said to Samuel, Behold, I will do a thing in Israel, at which both the ears of every one that heareth it shall tingle. . . . And Samuel lay until the morning. . . . And Eli called Samuel, and said, Samuel, my son. And he answered, Here am I. And he said, What is the thing that the Lord hath said unto thee?”

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So it is true today that many cannot hear God's "still small voice" (1 Kings 19:12) speaking to them.

Once Jesus, while thinking of His approaching death, prayed, saying: "Father, glorify thy name. Then came there a voice from heaven, saying, I have both glorified it, and will glorify it again." However, the people standing by did not understand, but "said that it thundered: others said, An angel spake to him" (John 12:28, 29). No wonder God said to such: "Hear, ye deaf . . . open the ear, but he heareth not" (Isaiah 42:18, 20), and again "having ears, hear ye not" (Mark 8:18).

Man's sense of seeing now is no sharper than his sense of hearing. We all know that light, by which we see, consists of electromagnetic waves. The portion that our eyes can see is limited to the visible portion of the spectrum. Those light rays which have shorter wave lengths than we can see are called ultraviolet rays, and those rays which have longer wave lengths than we can see are called infrared rays. Our eyes are sensitive to only about 3 per cent of all electromagnetic waves. These in the order of increasing wave length are: cosmic rays, gamma rays, X-rays, ultraviolet rays, visible light, infrared rays, radio waves, and electric waves.

There is no reason why man cannot see more. Owls, which catch their prey at night, can see in the dark. So can infrared films, which were exten-

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sively used during the last war in photographing camouflaged military objectives. Some animals are noted for their keen eyesight. Hawks and vultures soaring high in the air can see little rodents moving through the grass. A case where the man of God saw what his less spiritual servant did not see was recorded in 2 Kings 6:8-17: "Then the king of Syria warred against Israel. . . . And when the servant of the man of God was risen early, and gone forth, behold, an host compassed the city both with horses and chariots. And his servant said unto him Alas, my master! how shall we do? And he answered, Fear not: for they that be with us are more than they that be with them. And Elisha prayed, and said, Lord, I pray thee, open his eyes, that he may see. And the Lord opened the eyes of the young man; and he saw: and behold, the mountain was full of horses and chariots of fire round about Elisha."

Also, the partaking of God's divine nature will enable man to withstand strong light with no ill effects. Thus, while the wicked shall God "destroy with the brightness of his coming" (2 Thessalonians 2:8), the brightness of God's glory will have no effect on the redeemed. Speaking of the New Jerusalem, John said: "And the city had no need of the sun, neither of the moon, to shine in it: for the glory of God did lighten it" (Revelation 21:23). Again he said: "And there shall be no night there; and they

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need no candle, neither light of the sun; for the Lord God giveth them light" (Revelation 22:5).

One person who had an experience of this future effulgent glory while on earth was Moses. While "there were thunders and lightnings upon the mount . . . and all the people that was in the camp trembled, the Lord called Moses up to the top of the mount; and Moses went up" (Exodus 19:16-20). This was but a brief visit to Mount Sinai by Moses. Later on he went up again and stayed for forty days and forty nights. Here is a description of it: "And the sight of the glory of the Lord was like devouring fire on the top of the mount in the eyes of the children of Israel. And Moses went into the midst of the cloud, and gat up into the mount: and Moses was in the mount forty days and forty nights" (Exodus 24:17,18).

Man has also lost some of his sensitivity of smell, taste, and touch. In these senses, he finds that certain animals surpass him. For example, certain kinds of male moths can smell the female of their own kind miles away. Butterflies can tell differences in the sweetness of substances that taste alike to human beings. The fact that blind persons have a better sense of touch shows that the senses possessed by a normal person are not limited; they can be improved or dulled. Ellen G. White said, "All should guard the senses, lest Satan gain victory over them; for these are the avenues to the soul." Reading filthy

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literature, listening to cheap music, eating stimulating foods, drinking alcoholic beverages, smoking—all these tend to dull the senses and weaken the soul. A Christian who wishes to receive impressions by the Holy Spirit to guide his life should avoid all unhealthy practices that dull his senses.

POWER OF RESTORING LIFE AND HEALTH

God is the giver of life and health; thus those who partake of His divine nature share God's power of restoring life and health, provided God sees fit to give them such power.

An example of restoring life to a dead person was the raising of the dead son of a Shunammite woman by Elisha as recorded in 2 Kings 4:32-35: "And when Elisha was come into the house, behold, the child was dead, and laid upon his bed. He went in therefore, and shut the door upon them twain, and prayed unto the Lord. And he went up, and lay upon the child, and put his mouth upon his mouth, and his eyes upon his eyes, and his hands upon his hands: and he stretched himself upon the child: and the flesh of the child waxed warm. Then he returned, and walked in the house to and fro; and went up, and stretched himself upon him; and the child sneezed seven times, and the child opened his eyes."

One interesting aspect of this story is Elisha's

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method of resuscitation. The American Red Cross decided that this method of resuscitation is better than any of the complicated ways that have been attempted by modern medicine in recent years. In announcing that it is abandoning pulmotors, manual respiration, and other methods in favor of simple, direct mouth-to-mouth breathing into the lungs of the unconscious drowning or shock victim, the Red Cross called the attention to the above text.

It is also interesting to recall that that was the way God imparted life to Adam, the first human being He created. "And the Lord God formed man of the dust of the ground, and breathed into his nostrils the breath of life; and man became a living soul" (Genesis 2:7).

Other instances of the dead being raised to life include the following:

The Son of the Widow of Zarephath (1 Kings 17:17-24)

Jairus' daughter (Mark 5:22-24, 35-42)

The widow's son at Nain (Luke 7:11-17)

Lazarus (John 11:1-45)

Dorcas (Acts 9:36-41)

Eutychus (Acts 20:9, 10)

All those who performed the miracles were men fully dedicated to God and responsive to His Spirit. Only those who had living connection with the life-giving source could impart life to others.

Another kind of miracle related to that of resur-

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recting the dead is divine healing. While faith on the part of the sick is generally necessary in such instances, more important is the possession of divine power by the healer. Jesus derived His power from the Father (Matthew 28:18; John 17:2). His disciples received their "power to heal sicknesses," "power to cure diseases," and "power to heal all manner of sickness and all manner of disease" from Jesus their master (Mark 3:15; Luke 9:1; Matthew 10:1). If these Bible writers were modern men, some might have used the word "energy" instead of "power," since we hear so much about energy—mechanical, electric, solar, atomic, or nuclear.

Scientists in recent years have learned a great deal about the propagation, transmission, and utilization of energy. For instance, they learned that to reach an adjacent or distant object in order to produce certain changes, the energy has to flow to it through direct contact or through space. In the case of electric utilities, whether operated by direct or alternating current, the electric appliance and the source of electricity have to be in direct contact. On the other hand, in the case of radio waves or radioactivity, the receiver and the source are separated by certain distances and the power must travel through space. With such scientific knowledge, men should be better able to understand certain aspects of divine healing. As an illustration, we shall mention the following incident which hap-

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pened to Jesus at one time: "A woman, which was diseased with an issue of blood twelve years, came behind him, and touched the hem of his garment: For she said with herself, If I may but touch his garment, I shall be whole. But Jesus turned him about, and when he saw her, he said, Daughter, be of good comfort; thy faith hath made thee whole. And the woman was made whole from that hour" (Matthew 9:20-22). What made Jesus turn was His awareness of the sudden withdrawal of divine energy from Him by this hemorrhagic woman.

But direct contact between the sick and the healer is not always necessary. In Acts 5:15, we read: "Insomuch that they brought forth the sick into the streets, and laid them on beds and couches, that at the least the shadow of Peter passing by might overshadow some of them." This is like a cancer patient receiving X-ray or radiation treatment; distance from the source is no hindrance to receiving the healing power. If X-ray or radiation energy from radium can cure certain diseases, why can't divine healing energy do the same?

In John 4:46-54 we find a case of healing where the sick and the healer were separated by considerable distance. We read: "There was a nobleman, whose son was sick as Capernaum. Only when he heard that Jesus was come out of Judaea into Galilee, he went unto him, and besought him that he would come down, and heal his son: for he was at

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the point of death. Then said Jesus unto him, Except ye see signs and wonders, ye will not believe. The nobleman saith unto him, Sir, come down ere my child die. Jesus saith unto him, Go thy way; thy son liveth."

In Jesus' time, it was not known that an action originating at one place could produce a reaction at another place miles away simultaneously. No one had yet discovered the speed of light and electricity, namely, 186,000 miles per second. Knowing this today, we can easily see how Jesus' divine energy could reach the nobleman's son "at the same hour" when Jesus said to this father "go thy way; thy son liveth." The reason why only this man's sick son received that divine energy, but not others, is that he had tuned in to the right wave length, as it were, and there was resonance or harmony.

RESISTANCE TO HEAT AND COLD

Another characteristic of divine nature is its indifference to extreme temperature changes. A person can be resistant to extreme heat and cold if he is endowed with that kind of divine nature. An example of resistance to extreme heat is found in Daniel 3. The story recorded there relates to three Hebrew captives who, for refusing to worship the golden image of Nebuchadnezzar, the king of Babylon, were cast into a burning fiery furnace.

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Beginning with verse 19, we read: "Then was Nebuchadnezzar full of fury, and the form of his visage was changed against Shadrach, Meshach, and Abednego: therefore he spake, and commanded that they should heat the furnace one seven times more than it was wont to be heated. And he commanded the most mighty men that were in his army to bind Shadrach, Meshach, and Abednego, and to cast them into the burning fiery furnace. Then these men were bound in their coats, their hosen, and their hats, and their other garments, and were cast into the midst of the burning fiery furnace. Therefore because the King's commandment was urgent, and the furnace exceeding hot, the flame of the fire slew those men that took up Shadrach, Meshach, and Abednego. And these three men, Shadrach, Meshach, and Abednego, fell down bound into the midst of the burning fiery furnace. Then Nebuchadnezzar the king was astonished, and rose up in haste, and spake, and said unto his counsellors, Did not we cast three men bound into the midst of the fire? They answered and said unto the king, True, O King. He answered and said, Lo, I see four men loose, walking in the midst of the fire, and they have no hurt; and the form of the fourth is like the Son of God. Then Nebuchadnezzar came near to the mouth of the burning fiery furnace, and spake, and said, Shadrach, Meshach, and Abednego, ye servants of the most high God, come forth, and come

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hither. Then Shadrach, Meshach, and Abednego, came forth of the midst of the fire. And the princes, governors, and captains, and the king's counsellors, being gathered together, saw these men, upon whose bodies the fire had no power, nor was an hair of their head singed, neither were their coats changed, nor the smell of fire had passed on them. Then Nebuchadnezzar spake, and said, Blessed be the God of Shadrach, Meshach, and Abednego, who hath sent his angel, and delivered his servants that trusted in him, and have changed the king's word, and yielded their bodies, that they might not serve nor worship any god, except their own God."

The human body is vulnerable to cold as well as to heat. Unless it is well protected, exposure to a temperature of 8° Fahrenheit is sufficient to cause frost-bite to the toes, fingers, ears, and tip of the nose. Longer exposure to lower temperature may result in death.

Because warm clothing and shelter are available to most people, these hazards seldom occur on earth. However, in space, where the temperature is much lower, it presents a problem. Normally, as one rises from the earth, the temperature drops at the rate of about two degrees centigrade for every one thousand feet and continues dropping until a height of about 35,000 feet is reached and a constant temperature of -55° centigrade is encountered.

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In terms of Fahrenheit, this is -67° . As the space traveler goes farther and farther away from the sun, he encounters still lower temperature. It has been estimated that the surface temperature of Jupiter is -140° C., that of Saturn is -155° C., and that of Uranus is below -180° C.

To protect himself against such low temperatures, the space traveler will either have to wear a heated space suit or live in an air-conditioned compartment of the spaceship, neither of which is a facile solution.

Yet when Elijah (2 Kings 2:1, 11) and Jesus (Acts 1:9-11) went to heaven, they had no space suits or air-conditioned spaceships to shelter them from the extreme cold. The divine nature with which they were endowed imparted to them the needed resistance.

Likewise, the saints will have the same resistance when they go to heaven at the second coming of Christ. Their heavenward trip is recorded in 1 Thessalonians 4:16, 17: "For the Lord himself shall descend from heaven with a shout, with the voice of the archangel, and with the trump of God: and the dead in Christ shall rise first: Then we which are alive and remain shall be caught up together with them in the clouds, to meet the Lord in the air: and so shall we ever be with the Lord."

It is possible for them to endure the cold of the space because they will be endowed with the divine

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nature in the following fashion: "In a moment, in the twinkling of an eye, at the last trump: for the trump shall sound, and the dead shall be raised incorruptible, and we shall be changed. For this corruptible must put on incorruption, and this mortal must put on immortality" (1 Corinthians 15:52, 53).

ANTIGRAVITY

Ever since the falling apple hit Sir Isaac Newton on the head (figuratively or in reality), man has learned that he, as well as the apple and all the other forms of matter, is bound to the earth by gravity, a force which he has not been able to control as he has electrostatic and electromagnetic forces. He cannot do anything about gravity because, according to Dr. Einstein, gravity is not a force which pulls objects to earth, but rather is the result of the pressure of the curvature of space itself on the earth.

However, attempts have been made to control gravity, the greatest being that by Roger Babson, the famed business forecaster of Wellesley, Massachusetts. In 1948 he founded the Gravity Research Foundation in New Boston, New Hampshire, to stimulate a search for a gravity insulator, gravity absorber, or gravity reflector. Five awards are given each year for essays on gravity, ranging from

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\$100 to \$1000. While in theory all the award-winning papers sound very scholarly, being written by outstanding scientists of Harvard, Columbia, Cornell, Princeton, and University of California, no practical method which would cut off gravity has been found. A number of years ago a metal alloy called "cavorite" that was impenetrable to the force of gravity was mentioned in H. G. Wells' book of scientific fiction, *The First Men in the Moon*. But in actual practice, such a magic alloy, which when placed under a material body is capable of shielding it from the gravitational pull of the earth, has never been found.

According to modern physicists, shielding gravity is possible, though not on this earth. This is the way Dr. George Gamow reasoned: "If one can shield electric and magnetic forces, why not gravity? To answer this question we must consider the mechanism of electric and magnetic shielding. Each atom or molecule in any piece of matter is a system of positive and negative electric charges; in conducting metals there are numbers of negative electrons that are free to move through the crystal lattice of positively charged ions. When a metal is placed in an electric field, the free electrons move to one side of the material, giving it a negative charge and leaving the opposite side positive. This polarization produces a new electric field, which is directed opposite to the original field. Thus the

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two can cancel each other. Similarly, magnetic shielding depends on the fact that the atoms of magnetic materials are tiny magnets, with north and south poles that line up so as to produce a field that opposes an external magnetic field. Here also the shielding effect arises from polarization of atomic particles.

"Gravitational polarization, which could make possible shielding against the force of gravity, requires that matter be constituted of two kinds of particles: some with positive gravitational mass, which are attracted by the earth, and some with negative gravitational mass, which are repelled."—*Scientific American*, March, 1961, pp. 105, 106.

Such matter with negative gravitational mass is known as *antimatter*. Its composition would be just opposite to that of normal matter. According to modern physics, the smallest unit of matter having the characteristics of an element is the atom, and the atom is composed of a positive nucleus containing neutrons and positively charged protons with negatively charged electrons revolving around the nucleus at considerable distances. The structure of the anti-atom of the antimatter would be just opposite: a negatively charged nucleus containing anti-neutrons and negatively charged anti-protons with positively charged anti-electrons revolving around the nucleus at considerable distances.

Because when an anti-particle meets its counter-

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part, both disappear in material annihilation, anti-particles are rare in nature. However, they have been found, and their discovery has won Nobel prizes for a number of prominent scientists. The following is a brief summary of the discovery of the basic particles and their counterparts:

The electron by Sir J. J. Thomson in 1897.

The proton by Lord Ernest Rutherford in 1919.

The anti-electron or positron by Dr. Carl D. Anderson in 1932.

The neutron by Sir James Chadwick in 1932.

The anti-proton by Dr. Emilio Segre in 1955.

The anti-neutron by Drs. Bruce Cork, Glen Lambertson, Oreste Piccioni, and William Wenzel in 1956.

Particles of antimatter, called antilambdas, were photographed in the new 6-foot bubble chambers at the University of California's Lawrence Radiation Laboratory in 1959.

While anti-particles and antimatter are of rare occurrence on earth, they are believed to be dominant elsewhere. The concept of symmetry, says Dr. Segre, calls for equal numbers of particles and anti-particles, gathered into equal amounts of matter and antimatter in the universe.

The occurrence of antimatter in certain galaxies was described by Maurice Duquesne in his book, *Matter and Antimatter* (Harper 1960) as follows:

"The Crab Nebula in Taurus is 4,000 light-years

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distant and is a member of our own galaxy. It consists of the expanding gases of a star which exploded as a supernova in A. D. 1054, and is a powerful radio-transmitter with a strong magnetic field. Its radio output of 10^{24} kilowatts is consistent with the presence of antimatter."—Facing p. 33.

"Cygnus-A, at a distance of 270 million light-years, is one of the most powerful known radio-transmitters and appears to be a pair of colliding galaxies. Its observed radio output of about 10^{33} kilowatts can be calculated on the assumption that it contains some antimatter."—Facing p. 64.

"The globular galaxy M 87, in Virgo, appears to be either ejecting or absorbing a bright blue jet of matter. It emits intensely powerful radio and light waves that can be accounted for if it is assumed that the galaxy has encountered a patch of antimatter which is now undergoing annihilation."—Facing p. 65.

Thus we see why man is unable to lift himself up by his bootstraps while heavenly beings are able to travel from one heavenly body to another without being hampered by their gravitational pull. The Bible has recorded many visits of this earth by the heavenly angels. While the scientists like to call antigravity a property of antimatter, the author prefers to call it divine nature. Antimatter with negative gravitational mass is still more or less a speculation. But antigravity as an attribute of divine

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nature is amply supported by the Bible, not only by the flights of angels, but also by examples cited below.

The first human being who went to heaven was Enoch (Genesis 5:24). God took him to heaven because "he walked with God," which implies that he was in complete harmony with God and shared His attributes.

The next person who went to heaven was Moses (Matthew 17:1-3), the meekest man who ever lived on earth (Numbers 12:3). He talked with God many times, and at one time his face shone with divine glory (Exodus 34:29-33).

The third person who went to heaven was Elijah (2 Kings 2:11). He was a man of God, full of divine nature. Just before he was taken to heaven, he performed the miracle of dividing the waters of Jordan so that he and Elisha walked over on dry ground (2 Kings 2:8). Also at one time "he prayed earnestly that it might not rain: and it rained not on the earth by the space of three years and six months. And he prayed again, and the heaven gave rain, and the earth brought forth her fruit" (James 5:17, 18).

Then there was the case of Peter who overcame gravity while walking to Jesus on the sea of Galilee. The incident was recorded in Matthew 14:24-29: "But the ship was now in the midst of the sea, tossed with waves: for the wind was contrary. And in the

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fourth watch of the night Jesus went unto them, walking on the sea. And when the disciples saw Him walking on the sea, they were troubled, saying, It is a spirit; and they cried out for fear. But straightway Jesus spake unto them, saying, Be of good cheer; it is I, be not afraid. And Peter answered him and said, Lord, if it be thou, bid me come unto thee on the water. And he said, Come. And when Peter was come down out of the ship, he walked on the water, to go to Jesus." Peter was able to do so because he had a divine being by his side and he had faith to accept the divine nature imparted to him. However, when later Peter exhibited doubt, his antigravity virtue instantly left him and he began to sink. Here is what the record says, "When he (Peter) saw the wind boisterous, he was afraid; and beginning to sink, he cried, saying, Lord, save me. And immediately Jesus stretched forth his hand, and caught him and said unto him, O thou of little faith, wherefore didst thou doubt?" (Matthew 14:30, 31).

Of course, for Jesus to walk on the surface of the water in defiance of gravity was a small matter, since He possessed divinity. Later, He even ascended to heaven, which incident was recorded in Acts 1:9-11: "And when he had spoken these things, while they beheld, he was taken up; and a cloud received him out of their sight. And while they looked stedfastly toward heaven as he went up, be-

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hold, two men stood by them in white apparel; which also said, Ye men of Galilee, why stand ye gazing up into heaven? the same Jesus, which is taken up from you into heaven, shall so come in like manner as ye have seen him go into heaven."

Soon Jesus is going to come to fulfill this promise and the righteous shall likewise be able to overcome gravity and to go to heaven. The Scripture says, "For the Lord himself shall descend from heaven with a shout, with the voice of the archangel, and with the trump of God: and the dead in Christ shall rise first: Then we which are alive and remain shall be caught up together with them in the clouds, to meet the Lord in the air: and so shall we ever be with the Lord" (1 Thessalonians 4:16, 17).

Chapter 7

ETERNAL LIFE— FACT OR FANCY?

WHEN GOD created man, He put in him an innate desire to live for ever. Yet, with the exception of Enoch and Elijah, all men have tasted death. Adam, who received his life directly from God, lived to be 930 years old, then died. Methuselah, the longest lived human being, attained 969 years. The average life-span for the world's population is less than the Biblical "three score and ten." The alchemists during ancient times and the Middle Ages tried in vain to find the elixir of life. The modern gerontologists, whose researches are generously supported by government and private institutions, have done much to elucidate the cause of aging which inevitably leads to death; but the successful counter action of the natural processes of

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aging, leading to an unusual lifespan of 100, 120, or even 150 years, seems to be a long way off. It is almost as if man was never given the knowledge.

WHAT CAUSES AGING?

What happens in the human body as it grows older? Scientists have noted the following age-related changes:

1. Highly specialized cells develop a reduced capacity to divide and form similar new cells. Thus wounds repair and fractures heal much more slowly in old than in young persons.

2. Collagen taken from aged animals is less readily solubilized than that from young animals. We have all noted how much more rigid the nails (a form of collagen) from an elderly person are in comparison with those from babies or youngsters.

3. Skin and blood vessels become less elastic with age. This explains the wrinkles on the faces and hands of the aged.

Dr. Leonthine Goldschmidt at Greedmoor Institute of Psychobiologic Studies found that the red blood cells of older persons are destroyed by heat at a faster rate than those of younger persons.

4. As animals grow older, many of their tissues and cells accumulate calcium, cholesterol, and insoluble pigments. All these substances cause the

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hardening of blood vessels or arteriosclerosis. One writer claims that arteriosclerosis is the cause of death in every human being who lives long enough. The accumulation of calcium in aged persons causes stiffness and brittleness of their bones. The accumulation of cholesterol in the coronary arteries is the most common cause of heart attacks among the elderly. "Age pigments" is a term that has been used for those mysterious intra-cellular pigments that accumulate with age.

5. Decrease of certain hormone output. Dr. Gregory Pincus of the Worcester Foundation for Experimental Biology found that the excretion of etiocholanolone and androsterone in the urine decreases with age.

6. Enzyme activity changes. Dr. Abraham White of the Albert Einstein College of Medicine of Yeshiva University found that aspartate-ketoglutarate transaminase activity is less in the lymphocytes from younger rats than from older animals.

Dr. Morris Fishbein, editor of *Postgraduate Medicine*, said that by controlling the body's enzyme systems, physicians will help a patient stave off degeneration and aging of the heart, blood vessels, and endocrine glands, and many will be going strong at 80 years of age.

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THEORIES OF AGING

The whys of aging are less known, though there are many theories.

According to the "Clinker Theory," aging occurs because "rare and irreparable metabolic accidents beyond the genetic design gradually result in the accumulation of insoluble, non-functional, or noxious by-products." So says Dr. Bernard L. Strehler of the National Institutes of Health.

F. Marott Sinex of Boston University says that aging is primarily caused by molecular changes in nucleic acid and protein, which alter and contract with age because of thermal denaturation.

Related to the above theory is Dr. Johan A. Bjorksten's theory that human aging process is caused by the cross linking of the body's protein molecules.

Another theory says aging may be due in part to the harmful side effects of such radicals as HO and HO² that are produced in the normal course of metabolism in the body.

Dr. Hans Selye of the University of Montreal has said that "a breakdown of the hormonal adaptation mechanism appears to be the common cause of aging."

Delos Smith, science writer for the United Press,

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merely says: "Body cells may have a built-in internal urge to age."

From the foregoing we may conclude that man was created mortal or destined to die. Now let us see what the Bible and science offer on the subject.

BIBLE AND SCIENCE BOTH TEACH ETERNAL LIFE

In Genesis 3:22 we read: "Lest he put forth his hand, and take also of the tree of life, and eat, and live for ever." This verse implies that if Adam had not sinned by eating the forbidden fruit of the tree of knowledge of good and evil, he would have been privileged to eat the fruit of the tree of life continually and live forever.

What was in the fruit of the tree of life that had the property of sustaining life forever, the Bible did not tell us. What we do know is that aside from accidents and diseases, men die because of lack of proper nourishment or because of the accumulation of poisonous wastes. These facts were conclusively proven by Dr. Alexis Carrel's experiment with a fragment of chicken heart.

Dr. Alexis Carrel, a French surgeon and biologist, who later emigrated to the United States, won the Nobel Prize in physiology in 1912. On January 17 of that year, he opened a hen's egg and cut out a tiny fragment of tissue from the heart of the

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developing chicken. He predicted that, given proper nourishment and having waste removed by frequent changes of the nutrient solution, it could be kept alive forever. As predicted, the heart tissue remained alive and grew so fast that half of it was cut off twice a week and thrown away. It was still alive when Carrel died in 1944, 32 years after the experiment began. Referring to this piece of continuously living and growing tissue, Robert Collier wrote in 1942: "As far as anyone can see, if given the same care it will be alive and growing 2,500 years from now!" However, the experiment was deliberately ended in 1946.

From this we might infer that the fruit of the tree of life was a perfect food in that it contained in sufficient quantities all the essential nutrients of carbohydrates, fats, proteins, minerals and vitamins to impart perfect health, as well as sufficient anti-waste substances to ward off aging and degeneration. Nutritionists are all agreed that no perfect food exists today. Milk, used to be regarded as nearly a perfect food, has been found wanting in recent years, and, as we shall see in a later chapter, more and more people are finding fault with it.

That man himself had the capacity of living eternally was recently voiced by a prominent American scientist. Addressing the University of Southern California Faculty Club, Dr. Linus Paul-

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ing, Nobel Prize-winning chemist of the California Institute of Technology, said: "People should live forever." He backed up his statement by saying that "his bodily tissues replace themselves, he is a self-repairing machine."

Disclosing results of research by himself and his associates on aging and death, he continued: "We constantly insult ourselves by doing things for which our bodies were never intended, and the result of these recurrent insults is aging and death." As an example, he cited cigarette smoking, which shortens the life-span about one-fifth of a day per pack smoked. That is 14.4 minutes per cigarette or about three times as long as it takes to smoke it."

The recent discovery of a "juvenile hormone" in the human body was described in the October, 1960, *Science Digest*. In 1956, Dr. Carroll Williams, head of Harvard University's Department of Biology, extracted *Cecropia* silkworm abdomens with ether and obtained a juvenile hormone. When he implanted this hormone from young caterpillars into older ones, the older caterpillars stopped aging. They refused to spin cocoons and become butterflies.

Subsequently Dr. Williams discovered that the juvenile hormone blocked changes by completely stabilizing the insect's nervous system and all other bodily systems in any stage of life.

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Later he found the juvenile hormone in the human placenta.

It is most probable that there was a rapid decrease in the anti-aging juvenile hormone in the body after man's fall so that by Noah's time man's age had dropped from the original nine hundred odd years to one hundred twenty years (Genesis 6:3).

The giant redwood trees in Northern California also testify to God's original intention that the living things He created were to live forever. The 272-foot-tall "General Sherman," believed to be 4,000 to 5,000 years old, still grows luxuriantly in Sequoia National Park today. No wonder God compared the life of the redeemed to the life of a tree and said through the prophet Isaiah: "For as the days of a tree are the days of My people, and Mine elect shall long enjoy the work of their hands" (Isaiah 65:22).

Thus we note that man was created to live eternally. Only after his sinning was the privilege of living an eternal life deprived him. God had said: "Of the tree of knowledge of good and evil, thou shalt not eat of it: for in the day that thou eatest thereof thou shalt surely die" (Genesis 2:17). But Adam, yielding to temptation, ate the forbidden fruit and sinned, sin being "the transgression of the law" (1 John 3:4). This brought on death, for "the wages of sin is death" (Romans 6:23). By

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heredity, Adam's sin and death then passed on to all men. Paul says in Romans 5:12: "Wherefore, as by one man sin entered into the world . . . so death passed upon all men, for that all have sinned."

IMMORTALITY HEREAFTER

Even though eternal life was lost through the first Adam, it will be restored through the second Adam by the plan of redemption,—the death of Jesus Christ on Calvary's cross. The following is the Biblical teaching concerning eternal life:

1. Eternal life was promised before the world began. "In hope of eternal life, which God, that cannot lie, promised before the world began" (Titus 1:2).

2. Eternal life is a gift of God. "For the wages of sin is death; but the gift of God is eternal life through Jesus Christ our Lord" (Romans 6:21).

3. Eternal life may be obtained by believing in Jesus Christ. "For God so loved the world, that he gave his only begotten Son, that whosoever believeth in him should not perish, but have everlasting life" (John 3:16).

4. Eternal life or immortality is conferred upon the righteous at the time of resurrection at Jesus' second coming. "We shall not all sleep, but we shall all be changed, in a moment, in the twinkling

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of an eye, at the last trump: for the trumpet shall sound, and the dead shall be raised incorruptible, and we shall be changed. For this corruptible must put on incorruption, and this mortal must put on immortality" (1 Corinthians 15:51-53).

5. The tree of life will again play its original role. "To him that overcometh will I give to eat of the tree of life, which is in the midst of the paradise of God" (Revelation 2:7).

Among other things, the imparted immortality will enable the saints to defy the force of gravity and ascend to heaven, as Paul informed us in 1 Thesalonians 4:14-17: "For if we believe that Jesus died and rose again, even so them also which sleep in Jesus will God bring with him . . . For the Lord himself shall descend from heaven with a shout, with the voice of the archangel, and with the trump of God: and the dead in Christ shall rise first: Then we which are alive and remain shall be caught up together with them in the clouds, to meet the Lord in the air: and so shall we ever be with the Lord."

The saints' journey to heaven to join Jesus fulfills His comforting promise recorded in John 14:3: "And if I go and prepare a place for you, I will come again, and receive you unto myself; that where I am, there ye may be also." It is also God's answer to the Savior's prayer: "Father, I will that they also, whom thou hast given me, be with me where I

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am; that they may behold my glory, which thou hast given me" (John 17:24).

Now how far is heaven where God dwells? In an earlier chapter, we have shown that God's dwelling place is in the open space in Orion. It has been estimated that the distance of the Great Orion Nebula containing the open space is 2,400,000,000 times the distance between the earth and the sun. Even traveling at the speed of light of 186,000 miles per second, it would take the saints more than 36,000 years to make the trip. They must be able to travel at speeds many thousand times the speed of light,¹ or it will take them too long to get there. Even if heaven were a thousand times closer, it would still take years to get there even at the speed of light. Because God's universe is so vast, and the different worlds the saints will visit (Revelation 14:4; *Early Writings*, p. 40) are likely so far apart astronomically speaking, it would be unthinkable to imagine that their speed of travel can be anything short of the speed of light.

Now you may ask: What does the speed of travel have to do with eternal life? Let us see if science sheds any light upon the relation between the two.

1. Those who think there is nothing in the universe that can exceed the speed of light have misunderstood Einstein's theory, as Dr. Milton Rothman pointed out in his *Scientific American* (July, 1960) article, "Things that Go Faster than Light." Among the examples given that move faster than light are electromagnetic waves in a plasma or wave guide, Louis de Broglie's "particle wave," waves that represent atomic particles.

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According to Einstein's special theory of relativity, the passing of time by a man traveling at high speed is different from one at rest. The difference can be calculated by using the so-called *time dilation* equation

$$t' = t \sqrt{1 - \frac{v^2}{c^2}}$$

Where t' = passing of time by one traveling at velocity v

t = passing of time by one comparatively at rest

c = the velocity of light, 186,000 miles per second

It can be shown by calculation that a person traveling at 93,000 miles per second is passing nine-tenths of the time passed by a man at rest. If the traveler's speed is increased to 161,000 miles per second, his passing of time will be only one-half of his friend's time at rest.

This relativistic phenomenon is interestingly portrayed by Dr. George Gamow in one of the stories in his book, *Mr. Tompkins in Wonderland*. At one of the train stops, a very old lady addressed a mid-aged gentleman getting off the train "Dear Grandfather." To explain why the old lady was his granddaughter, the gentleman said: "My business requires me to travel quite a lot, and, as I spend most of my life in the train, I naturally grow old much

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more slowly than my relatives living in the city. I am so glad that I can come back in time to see my dear little granddaughter still alive!"

Now, instead of riding on the train, which is comparatively slow, suppose the man is an astronaut in a spaceship capable of tremendous speeds. Let us see how much time he passes in comparison with his slow-moving friend on earth in 100 years. The surprising results of calculation are listed in the following tabulation:

Astronaut's Speed	Astronaut's Passing of Time Compared with Earthman's 100 Years
93,000 miles per second, or 0.5 of the speed of light	86 years
167,000 miles per second, or 0.9 of the speed of light	43.6 years
0.99 of the speed of light	14 years
0.999 "	4.5 years
0.9,999 "	1.4 years
0.99,999 "	5 months
0.999,999 "	1 month, 21 days
0.999,999,999 "	1.5 days

Thus we see that, during the 100 years of earth time, the astronaut traveling at 0.999,999,999 of the speed of light lived only one and one-half days. Now we can better understand 2 Peter 3:8 which reveals God's conception of "a thousand years as one day."

Carsbie Adams tells what might happen if the astronaut's speed were further increased. He says:

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"It becomes apparent that, if we could bring a space vehicle to speeds close to the speed of light, we could tour the universe within the lifetime of a human being. Yet if this hypothetical traveler should return to his original coordinate system (the earth) he might find (depending on how near to 'c' he managed to get) that thousands, millions, or even trillions of years have passed. Conceivably, the earth upon which he was born might have long since ceased to sustain life. Even the galaxy might have changed beyond recognition."²

Now another question: How much time will the astronaut pass during the 100 years of earth time if he travels at exactly the speed of light? The equation will tell you that he spends "no time," for t' in that case comes out to be zero. In other words, if a man could travel at the speed of light, he could live forever. Thus the Biblical teaching of eternal life is also supported by science. Can we rightly say, then, that eternal life is a fact rather than fancy?

2. By permission from *Space Flight*, by Carsbie Adams. Copyright, 1958, McGraw-Hill Book Company, Inc., p. 340.

Chapter 8

SAVED BY DIVINE BLOOD

BY EATING the forbidden fruit in the Garden of Eden, Adam and Eve disobeyed God's command (law) and sinned, for "sin is the transgression of the law" (1 John 3:4). And this brought death into the world, since "the wages of sin is death" (Romans 6:23).

Through heredity, Adam's sin and death passed on to all men. In Romans 5:12 we read: "Therefore, as by one man sin entered into the world, and death by sin; and so death passed upon all men, for all have sinned."

To save man from eternal death caused by sin, God conceived the plan of redemption, whereby Jesus, the Son of God, would come down from heaven to die in the sinner's stead. "For God so loved the world, that He gave His only begotten son, that whosoever believeth in him should not perish, but have everlasting life" (John 3:16).

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Some may ask why Jesus did not come to this earth as a divine being rather than being born a human babe. We find the answer to this question in the following Biblical texts:

"For in that he himself hath suffered being tempted, he is able to succour them that are tempted" (Hebrews 2:18).

"For we have not an high priest which cannot be touched with the feeling of our infirmities; but was in all points tempted like as we are, yet without sin" (Hebrews 4:15).

So that He might have a perfect understanding of the human soul and show broad, tender sympathy for the sorrows, weaknesses and temptations of humanity, "The Word was made flesh, and dwell among us, full of grace and truth" (John 1:14). Jesus' dual nature both as the Son of God and Son of man is thus explained.

Why couldn't Jesus be born of a human father and a divine mother as was the case in Greek mythology and certain fairy tales? This question will be answered when the scientific reason for the virgin birth is discussed.

THE VIRGIN BIRTH

By the mystery which we term incarnation, the Son of God became the Son of man. God might have used other methods to accomplish this, but the one He used was the virgin birth.

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The story of the virgin birth is recorded in Matthew 1:18-23 as follows:

"Now the birth of Jesus Christ was on this wise: When as his mother Mary was espoused to Joseph, before they came together, she was found with child of the Holy Ghost.

"Then Joseph her husband, being a just man, and not willing to make her a publick example, was minded to put her away privily.

"But while he thought on these things, behold, the angel of the Lord appeared unto him in a dream, saying, Joseph, thou son of David, fear not to take unto thee Mary thy wife for that which is conceived in her is of the Holy Ghost.

"And she shall bring forth a son, and thou shalt call his name JESUS: for he shall save his people from their sins.

"Now all this was done, that it might be fulfilled which was spoken of the Lord by the prophet, saying, Behold, a virgin shall be with child, and shall bring forth a son, and they shall call his name Emmanuel, which being interpreted is God with us."

In spite of such a clear record, the doctrine of virgin birth is rejected by some of the best informed theologians. How could a female give birth to a son without a male? To them it is absolutely unbelievable.

However, scientists discovered long ago that with some animals, the eggs can develop new individuals

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without fertilization. This process is called *parthenogenesis*. Bees are a common example. The workers and queens come from the fertilized eggs, while the drones come from unfertilized eggs. Scientists have found that it is possible by means of artificial stimulation to make the unfertilized eggs of some marine animals develop into new individuals by placing them in water containing proper concentration of salt. In the case of frogs, pricking the unfertilized eggs with a needle may cause them to develop into tadpoles.

Now if scientists could bring about reproduction without the male, certainly it would be facile for the omnipotent God to cause a virgin to give birth to a child without the father!

Other scientific reasons which will help us understand a little more of the great mystery were pointed out by Dr. DeHaan (M. D.), the radio evangelist of Grand Rapids, in his book *The Chemistry of the Blood*, from which we quote:

"The very fact that sin is in the blood necessitated the *Virgin Birth* of Christ if He was to be a son of Adam and yet a sinless man. For this very reason Christ could partake of Adam's flesh, which is not inherently sinful, but He could not partake of Adam's blood, which was completely impregnated with sin. God found a way by which Jesus, *born of a woman* (not man), could be a perfect human being, but, because He had not a drop of Adam's

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sin in his veins, He did not share in Adam's sin."—pp. 14, 15.

"As the first Adam's sin corrupted the blood of the entire human family, so the pure, sinless blood of the last Adam makes atonement for the sin of the world. For without shedding of blood is no remission. . . . It is the blood that makes an atonement for the soul."—p. 25.

"It is now definitely known that the blood which flows in an human babe's arteries and veins is not derived from the mother but is produced within the body of the foetus itself only after the introduction of the male sperm. An unfertilized ovum can never develop blood since the female egg does not by itself contain the elements essential for the production of this blood. It is only after the male element has entered the ovum that blood can develop. As a very simple illustration of this, think of the egg of a hen. An unfertilized egg is simply an ovum on a much larger scale than the human ovum. You may incubate this unfertilized hen's egg, but it will never develop. It will dry up completely but no chick will result. But let that egg be fertilized by the introduction of the male sperm and incubation will bring to light the presence of *Life in That Egg*. After a few hours it visibly develops. In a little while red streaks occur in the egg, denoting the presence of *Blood*.

"For this very reason it is unnecessary that a sin-

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gle drop of blood be given to the developing embryo in the womb of the mother. Such is the case according to science. The mother provides the foetus (the unborn developing infant) with the nutritive elements for the building of that little body in the secret of her bosom, but all the blood which forms in it is formed in the embryo itself and only as the result of the contribution of the male parent. From the time of conception to the time of birth of the infant not *One Single Drop of Blood* ever passes from mother to child. The placenta, that mass of temporary tissue known better as 'afterbirth,' forming the union between mother and child, is so constructed that although all the soluble nutritive elements such as proteins, fats, carbohydrates, salts, minerals and even antibodies pass freely from mother to child and the waste products of the child's metabolism are passed back to the mother's circulation, no actual interchange of a single drop of blood ever occurs normally. All the blood which is in that child is produced within the child itself as a result of the introduction of the male sperm. The mother contributes no blood at all."—pp. 31-33.

Then Dr. DeHaan quotes the following medical sources to prove his point:

"For the purpose of understanding its general functions it is sufficient to recall that the placenta consists essentially of vascular chorionic papillae

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from the foetus (the unborn child) bathed in the large blood spaces of the decidual membrane of the mother. The foetal and maternal blood *Do Not Come Into Actual Contact. They Are Separated From Each Other* by the walls of the foetal blood vessels and the epithelial layers of the chorionic villae.”—Howell’s *Textbook of Physiology*, Second Edition, pp. 885, 886.

“The foetal blood in the vessels of the chorionic villae *At No TIME Gains Access to the Maternal Blood* in the intervillous spaces, *Being Separated from One Another* by the double layer of chorionic epithelium . . . Normally there is no communication between the foetal blood and the maternal blood.”—William’s *Practice of Obstetrics*, Third Edition, pp. 133, 136.

Then he concludes with this observation: “How wonderfully God prepared for the virgin birth of His Son. When He created woman He made her so that no blood would be able to pass from her to her offspring. That blood is the result of the male. Since Adam was the federal head of the race, it is His Blood which transmits Adam’s sin. In order to produce a sinless man who would yet be the son of Adam, God must provide a way whereby that man would have a human body derived from Adam but have not a drop of Adam’s sinful blood. Right here is the scientific, biological reason for the sin-

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lessness of the Man Christ Jesus.”—*The Chemistry of the Blood*, p. 35.

If this were spiritually true also, then the blood Jesus shed on the cross originated with the Father. It was the Holy Spirit who brought the union of the divine with the human. Thus we see that in carrying out the plan of redemption, all three of the God-head were involved.

Since it was the Holy Spirit that contributed the blood of Jesus, it was divine blood; and being divine blood, it was incorruptible. That was the reason why Jesus' body did not decompose after death, as the following Scriptures indicated:

“But he, whom God raised again, saw no corruption” (Acts 13:37).

“He . . . spake of the resurrection of Christ, that his soul was not left in hell, neither his flesh did see corruption” (Acts 2:31).

So instead of undergoing putrefaction and rotting as in the case of other men, Jesus' body cells and tissues were kept from decomposition by His incorruptible blood. Not only that, but because “There is healing in His blood,” to use a phrase from the well-known hymn writer, Frederick W. Faber, soon after the Saviour died on the cross, the process of repair began at once and continued through the three days He was in the tomb. When the hour of resurrection came, His wounds had completely healed, His fatigue, caused by the agony on the

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cross, had disappeared, and His normal strength returned. Rather than going through the usual processes of decay like other dead men, Jesus, during the three days He spent in the tomb, was actually undergoing the process of healing and rejuvenation, so that by the end of the three days, He had completely recovered and was resurrected.

THE IMPORTANCE OF BLOOD

The Bible stressed the importance of blood some 3500 years ago by pointing to the fact that "life of the flesh is in the blood" (Leviticus 17:11). However, man has begun only in recent years to understand its importance to human life. A man can live without eyes, ears, nose, hands, feet, with one kidney lost, one lung removed, and three-fourths of the stomach excised, but no one can live without blood. That is why leukemia is so deadly. It is the blood that keeps every organ and tissue of the body alive by supplying oxygen and other nutrients and removing carbon dioxide and other wastes. When the blood supply is cut off from the heart muscles due to the formation of a blood clot in the coronary artery, the one so stricken often suffers instant death from heart attack, or if the blood supply is cut off from the brain by arterial occlusion, the individual dies of stroke. Indeed life is propagated by the blood.

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Not only does the blood of an individual keep him alive, but it can be transferred from him to another person to sustain life. In fact, it is the only body tissue that can be easily removed from one individual and transplanted in another without complications. No part of the human body has saved more lives of other individuals than the blood by transfusion. We can scarcely surmise the total number of people who owe their lives to the blood of others. But from the American Red Cross figures, the number must be very large; for that organization obtained between February 1941 and December 1955 a grand total of 31,000,000 pints from volunteers who gave their blood.

Pointing out the spiritual application of blood transfusions, Dr. Nelson Bell wrote: "In our own scientific age there are thousands living today who owe their lives to blood transfusions. By analogy, it can be reverently said, that, in a mystical sense, the Son of God is the great universal Donor, giving new life to the sinner who trusts in His shed blood for cleansing."—*Christianity Today*, Dec. 21, 1959, p. 19.

Blood from cadavers can be successfully used as well as blood from live donors. According to *Chemical and Engineering News* of August 15, 1960 "blood taken from cadavers is better in some respects than blood from live donors, Soviet physician Mikhail M. Tarasov told a New York

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Academy of Sciences conference on homotransplantation. As much as 6 to 8 pints of blood can be drawn from bodies within 10 hours after death by accidental or noninfective causes, he says. This blood does not clot, he explains, and so does not need chemical anticoagulants. It doesn't have to be refrigerated and is usable for five weeks. In Dr. Tarasov's Sklifosovsky Institute, 80 per cent of all blood now given in transfusions comes from cadavers."

We were saved by Jesus' blood, not while he was living, but only after he died. What a parallel between the physical and the spiritual!

DEATH AND SHEDDING OF BLOOD BOTH NECESSARY

It is true that to satisfy the claims of the law, which required the death of the sinner, it was necessary for Jesus to die in the sinner's stead. But unless His death was accompanied by the shedding of His blood, it would have availed nothing. This is made clear by the following Bible texts:

"For the life of the flesh is in the blood: and I have given it to you upon the altar to make an atonement for your souls: for it is the blood that maketh an atonement for the soul" (Leviticus 17:11).

"For this is my blood of the new testament which is shed for many for the remission of sin" (Matthew 26:28).

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“Without shedding of blood is no remission” (Hebrews 9:22).

“And the blood of Jesus Christ his Son cleanseth us from all sin” (1 John 1:17).

“Unto him that loved us, and washed us from our sins in his own blood” (Revelation 1:15).

“And they sung a new song, saying, Thou art worthy to take the book, and to open the seals thereof: for thou wast slain, and hast redeemed us to God by thy blood out of every kindred, and tongue, and people and nation” (Revelation 5:9).

The Passover and the sanctuary sacrificial services all pointed to the importance of the blood in the remission of sins.

From this we may reasonably infer that if Jesus had died a natural death from a heart attack or stroke, or an accidental death from drowning or food poisoning, or a penal death by hanging, electrocution, or cyanide gas, He would not have atoned our sins, because there was no shedding of blood.

On the other hand, if Jesus had been assassinated by stabbing or slaughtered on the altar of the temple as were the sacrificial animals, instead of being nailed on the cross, His shed blood and death would have fulfilled the requirement of the law and would have saved the fallen race. The cross became the symbol of salvation only because it happened to be the means which the Jews used to put Jesus to death by the shedding of His blood.

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The blood that Christ shed on the cross was the only divine element left on this earth, since His body left this earth at the time of His ascension. Some day He is coming back to claim this lost world by the purchase that He made with His own blood.

Chapter 9

PHYSIOLOGY, PATHOLOGY,
AND THEOLOGY

RELIGION should be more than a belief in gods or supernatural beings, a heavenly kingdom after death, or a spiritual existence beyond earth. A true religion should save a person's body as well as his soul. God's concern for man's health is expressed by John in these words: "Beloved, I wish above all things that thou mayest prosper and be in health, even as thy soul prospereth" (3 John 2).

There is a close connection between health and religion, because man's body is the temple of God. Paul emphasized this in 1 Corinthians 3:16, 17: "Know ye not that ye are the temple of God, and that the Spirit of God dwelleth in you? If any man defile the temple of God, him shall God destroy; for the temple of God is holy, which temple ye are."

To help man preserve this temple, He laid down

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certain conditions. These are recorded in Exodus 15:26: "If thou wilt diligently hearken to the voice of the Lord thy God, and wilt do that which is right in His sight, and wilt give ear to His commandments, and keep all His statutes, I will put none of these diseases upon thee, which I have brought upon the Egyptians: for I am the Lord that healeth thee."

Many diseases have come to man as a result of his disregard of certain of God's commandments—the health laws. Since there is insufficient space to mention all the diseases that are attributable to man's disobedience of God's health laws, we shall limit our discussion to only one, a most important ailment—heart disease.

THE NATURE AND PRIMARY CAUSE OF HEART DISEASE

Heart Disease is the number one killer in the United States today. With other cardiovascular diseases, it produced 894,100 deaths in 1958, or 54.3 per cent of all deaths for the year, which was more than the other nine leading causes combined. The other nine include cancer, accidents, pneumonia, diabetes, and diseases of the kidney.

The primary cause of heart disease is nutritional in nature. It consists of a deposit in the coronary artery of a fat-like substance called cholesterol, which eventually may lead to the formation of a blood clot, the immediate cause of heart attack.

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Though the body produces a limited amount of cholesterol for its essential use, the amount may be increased by eating foods containing it. It has been found that all animal foods contain cholesterol, the richest sources being eggs, butter, cheese, meat, poultry, and milk given in the order of decreasing abundance. Cholesterol is found in the fat portion of these animal foods.

Another type of food, though not of animal origin, which stimulates an increase in the cholesterol content of the blood is the solid shortenings that are prepared from vegetable oils by hydrogenation. Unhydrogenated vegetable oils, on the other hand, initiate a decrease in the cholesterol level. Animal fats (aside from their cholesterol content) and hydrogenated vegetable shortenings differ from unhydrogenated vegetable oils in that the former are composed mostly of saturated fatty acids while the latter are composed chiefly of unsaturated fatty acids.

One survey which shows the close relationship between the type of diet and the blood cholesterol level was made by Dr. Merwyn G. Hardinge of Loma Linda University, who studied 201 adults who were using the following three diets: (1) lacto-ovovegetarian, a plant diet plus milk and eggs, but no meat, fish, or fowl; (2) pure vegetarian, a diet of plant foods, excluding milk and eggs; (3) non-vegetarian, the average American diet of milk,

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eggs, meat, and foods of plant origin. He found that there was no practical difference in regard to the height, weight, blood pressure, red cell count and hemoglobin concentration of the three dietary groups. However, the blood cholesterol levels of the three types were significantly different. The non-vegetarians had the highest blood cholesterol, the pure vegetarians the lowest, and the lacto-ovovegetarians fell in between.

Before going into a discussion of the role of religion in regard to diet, it would be well first to consider the findings of the so-called "epidemiological" study of heart disease made by a group of prominent heart specialists. They revealed that the United States has the highest incidence of heart disease. This is closely followed by Australia, Canada, and the Northern European countries all of which are predominantly Protestant. Next come the Southern European countries which are Catholic. This was followed by the Mohammedan countries of the Middle East, and finally the Buddhist countries like China and Japan. In the light of their dietary habits it is easy to explain the differences in their heart disease incidence. The United States and Australia are the greatest consumers of meat. The Northern Europeans are great users of dairy products. Southern Europeans use large quantities of olive oil, and Mohammedans ban the use of lard

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and pork, while the Buddhists live mostly on a vegetarian diet.

Actually, people whose lives are guided by the Bible should have the lowest incidence of heart disease, for true religion benefits a person's physical well-being as well as his soul. That this should be so, and that the high incidence of heart disease is brought about by man's disregard of the teachings of the Bible and of the example of Jesus Christ is clarified in the following discussion.

BIBLE TEACHES HOW TO AVOID HEART DISEASE

In the beginning God gave to the human race a pure vegetarian diet. "And God said, Behold, I have given you every herb bearing seed, which is upon the face of all the earth, and every tree, in the which is the fruit of a tree yielding seed; to you it shall be for meat" (Genesis 1:29).

Then later, because of the flood which had destroyed all vegetation (Genesis 9:3) and because of the murmuring of the children of Israel, God granted permission for the use of flesh food (Exodus 16:12, 13), in one case to meet a temporary emergency and at another time to calm a rebellious people. But, the use of the fat of the animal was still forbidden, for the Bible states:

"It shall be a perpetual statute for your gener-

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ations throughout all your dwellings, that ye eat neither fat nor blood.

“And the Lord spake unto Moses, saying, Speak unto the children of Israel, saying, Ye shall eat no manner of fat, of ox, of sheep, or of goat.

“For whosoever eateth the fat of the beasts, of which men offer an offering made by fire unto the Lord, even the soul that eateth it shall be cut off from among his people” (Leviticus 7:17, 23, 25).

Dr. Paul Dudley White, in referring to the above texts, said: “It is conceivable that a few years from now we medical men may repeat to the citizens of the United States the advice that Moses was asked by God to present to the Children of Israel 3,000 years ago.”

The Lord, who created the animals, knew that animal fats are rich in cholesterol and saturated fatty acids, which cause heart disease and shorten man's life, but it took man nearly six thousand years to make the discovery.

JESUS' DIET DID NOT CONTRIBUTE TO HEART DISEASE

Christians who relish a flesh diet often point to Jesus as their example, for the record shows that Jesus ate fish (Luke 24:42, 43), prepared fish for His disciples (John 21:12, 13), and twice fed the hungry multitude with fish and bread (Matthew

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14:15-21; 15:32-38). That He regarded fish as a good food was also indicated by His parable of prayer, in which He said: "Or what man is there of you, whom if his son ask bread, will give him a stone. Or if he ask a fish, will he give him a serpent?" (Matthew 7:9, 10).

Even though almost all animal foods may cause heart disease by virtue of their content of cholesterol and saturated fatty acids, fish is an exception. The strange thing about fish is that its fat is not solid like other animal fats, but is liquid like unhydrogenated vegetable oils and reacts like them in the human body. Instead of raising the cholesterol content of the blood as do all other animal fats, fish oil lowers it.

An interesting account showing the difference between meat and fish was given by Dr. J. DeWitt Fox, editor of *Life and Health* in the January, 1957, issue of his magazine: "Dr. John Judge, a friend of mine, recently told me that while working among the Eskimos of Canada he noted the scarcity of heart disease, but that a colleague, Dr. Jack Wilt, in a nearby area had many Eskimos with heart disease. When they compared notes on diet, they found that the Eskimos with no heart disease were eating fish and seal, whose fat is largely liquid; those with heart disease were eating caribou meat—a heavy, solid animal fat that is largely a saturated fat."

It was most probable that Jesus resorted to a

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pisci-vegetarian diet (a diet of fish and vegetables) out of necessity, but he could have picked no better animal food than fish. It took nearly two thousand years for scientists to discover the difference between fish and other animal foods in their relation to heart disease. What a remarkable revelation!

RELATION OF STRESS TO HEART DISEASE

Next to animal fats and hydrogenated vegetable shortenings, stress ranks the highest among contributory factors to heart disease.

How emotional stress—anger, fear, frustration, or anxiety—affects a person's blood cholesterol level was first demonstrated in Colonel Marshall E. Groover's experiments with Air Force personnel. He found that his patients developed the highest levels of cholesterol during periods of great stress, even under strict dietary regimen (one low in cholesterol).

Among Groover's case histories was the story of Colonel M. B., who worked for an unreasonable, hostile boss. His cholesterol level was high, but diet and exercise failed to help. When the boss was taken to the hospital (with cerebral arteriosclerosis), Colonel M. B.'s cholesterol level showed a remarkable drop.

Brigadier General F. R.'s cholesterol level was normal when he was assigned to Washington, but it

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showed a marked increase when he took over a demanding job in which he constantly had to meet deadlines. Later a change of duty to a pleasant job brought his cholesterol level down to normal.

According to a study made at the Loma Linda University, cholesterol increased significantly in medical students during examination weeks. In the study 44 male medical students of 21 to 37 years of age showed an increase of 11 per cent in their blood cholesterol level during examination periods over the value which they had when free from emotional and mental stress.

Rosenman and Friedman (*Journal of American Medical Association*, 169, 1286 (1959)) have recently compared a group of men exhibiting chronic excessive and competitive drive and an enhanced sense of time urgency (pattern A) with a group exhibiting the opposite type of behavior (pattern B). It was found that the men with behavior pattern A have a faster blood clotting time (6.4 minutes as against 7.2 minutes of the other group), higher serum cholesterol (276 mg. per cent as against 209 mg. per cent of the other group), and about seven times higher incidence of coronary heart disease than the other group of men of behavior pattern B.

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RELATION OF STRESS TO CERTAIN MINERAL ELEMENTS

Not long ago, Dr. Hans Selye, the greatest stress researcher, made a most significant discovery, which was reported in *Newsweek* of March 31, 1958 as follows:

"By giving the rat injections of certain chemicals (hormones and salts) and then exposing it to sudden stress (extreme cold, in this case), Selye had developed large, clearly visible yellowish patches on the vital heart muscle. All the rats thus treated always died. But what Selye has discovered is that other rats, treated exactly the same but given injections of magnesium and potassium, always live—apparently protected against stress . . . If Selye's magnesium-potassium treatments of rats worked successfully in humans, he had in his hands the means by which man in the future might be spared heart accidents brought on by stress."

A correlation of serum-magnesium and serum-cholesterol levels in man was found to exist by researchers Bersohn and Oelofse, who reported their finding in the *Lancet* of May 18, 1957. They found that the serum-magnesium levels were significantly higher in the South African Bantus, who had a very low incidence of heart disease, than in the Europeans, whose incidence of heart disease was high.

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They made the study following published reports that in many cases of coronary heart disease, a dramatic clinical improvement was made by parenteral administration of magnesium sulfate.

These findings are in line with the statistical reports published sometime ago in the *Bulletin of the Academy of Medicine* in France. In these reports M. L. Robinet discussed the French vital statistics regarding suicides (a result of stress) and their relationship to magnesium in the soil. The reports showed that in regions rich in magnesium suicides were nearly three times less frequent than in regions where the soil has less magnesium.

It should be pointed out in this connection that foods rich in potassium and magnesium are foods of plant origin, magnesium being the integral part of chlorophyll, the green coloring matter required by all plants for photosynthesis. On the other hand, foods of animal origin, such as meat, milk, and eggs, are high in sodium, but low in potassium and magnesium.

According to nutritional authorities, an adult needs about 1.2 grams of potassium and 0.6 gram of sodium a day, or a ratio of 2 to 1 between the two. A recent survey showed that the daily intake of potassium is about 2.4 grams, but the daily intake of sodium is from 8 to 15 grams. The individual who gets 15 grams of sodium per day is getting 25 times what he ought to have. Since, according to

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Bunge, an excess of sodium in the diet causes an excessive excretion of potassium, one can see the wisdom of using plenty of vegetables and fruits, especially by those individuals who already have high blood pressure or hypertensive heart disease caused by their high sodium (or salt) diets.

TRUE CHRISTIANS SHOULD HAVE VERY LITTLE STRESS

While proper diet can alleviate man's stress to a certain extent, the greatest help comes from the peace and serenity of religious experience. Let us see what the Bible teaches concerning emotional stresses such as fear, anxiety, etc.

Just as Jesus predicted, distress, perplexity, and fear have become the signs of the last days. In Luke 21:25, 26 we read; "And there shall be signs in the sun, and in the moon, and in the stars; and upon the earth distress of nations, with perplexity . . . Men's hearts failing them for fear, and for looking after those things which are coming on the earth."

However, fear is not God given, for Paul said: "God hath not given us the spirit of fear; but of power, and of love, and of a sound mind" (2 Timothy 1:7). John expressed the same thought when he said: "There is no fear in love; but perfect love casteth out fear" (1 John 4:18).

David confidently declared: "The Lord is my

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light and my salvation; whom shall I fear? the Lord is the strength of my life; of whom shall I be afraid? (Psalm 27:1).

Jesus Himself promised his disciples: "Peace I leave with you, my peace I give unto you: not as the world giveth, give I unto you. Let not your heart be troubled, neither let it be afraid" (John 14:27).

In other words, the antidote for fear is "the fruit of the Spirit (which) is love, joy, peace, longsuffering, gentleness, goodness, faith, meekness, temperance" (Galatians 5:22, 23).

Another form of stress that is raising the blood cholesterol level of modern man is worry and anxiety.

Studies show conclusively that nothing saps health and physical resistance more than worry. A university study has shown that 40 per cent of worries are over things that never happen, 30 per cent over things in the past, 22 per cent over petty trifles, and only 8 per cent of any consequence.

What did Jesus say about worrying for one's future? He said: "Therefore I say unto you, Take no thought for your life, what ye shall eat, or what ye shall drink; nor yet for your body, what ye shall put on. Is not the life more than meat, and the body more than raiment?"

"Behold the fowls of the air: for they sow not, neither do they reap, nor gather into barns; yet your heavenly Father feedeth them. Are ye not much

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better than they? Which of you by taking thought can add one cubit unto his stature?

"And why take ye thought for raiment? Consider the lilies of the field, how they grow; they toil not, neither do they spin; and yet I say unto you, That even Solomon in all his glory was not arrayed like one of these.

"Wherefore, if God so clothe the grass of the field, which today is, and tomorrow is cast into the oven, shall he not much more clothe you, O ye of little faith?" (Matthew 6:25-30).

The apostle Peter tells us what to do with our care: "Casting all your care upon him; for he careth for you" (1 Peter 5:7). So let us leave everything to God and Jesus.

Relating to stress, there are two good examples in the Bible that it is well for us to follow. One is Jesus. In spite of His great compassion upon the people, sometimes numbering five or even seven thousand, many of whom were sick and afflicted, there is no record to the effect that Jesus ever overworked. On the contrary, the record showed that, when He was tired, He often withdrew from the crowd and went into the desert or to the other side of the lake. Sometimes he advised his disciples to do so, as we read in Mark 6:31: "And he said unto them, Come ye yourselves apart into a desert place, and rest a while." The Creator of the human body knew how to avoid stress.

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Our next example is the apostle Paul. If any man ever passed through conditions of great stress, Paul did. Let us note the kind of stress he had to endure after he became Christ's minister of the gospel. Said he: "Are they ministers of Christ? (I speak as a fool) I am more; in labours more abundant, in stripes above measure, in prisons more frequent, in deaths oft. Of the Jews five times received I forty stripes save one. Thrice was I beaten with rods, once was I stoned, thrice I suffered shipwreck, a night and a day I have been in the deep; in journeyings often, in perils of waters, in perils of robbers, in perils by mine own countrymen, in perils by the heathen, in perils in the city, in perils in the wilderness, in perils in the sea, in perils among false brethren; in weariness and painfulness, in watchings often, in hunger and thirst, in fastings often, in cold and nakedness. Beside those things that are without, that which cometh upon daily, the care of all the churches" (2 Corinthians 11:23-28).

Yet Paul had the secret of combating stress by love, with trust and faith in both God and Jesus Christ. His formula of success is recorded in 2 Corinthians 4:8, 9 which reads: "We are troubled on every side, yet not distressed; we are perplexed, but not in despair; persecuted, but not forsaken; cast down, but not destroyed."

Thus we see that by eating proper God-given

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foods and practicing the Christian virtues, one can avoid to a great extent coronary heart disease,—that modern scourge which cuts down more American citizens than any other disease known to mankind.¹

1. For a more comprehensive study of heart disease, read the author's *Heart Disease—Cause, Prevention, and Recovery*.

Chapter 10

ELECTRIC BASIS OF MAN'S
COMMUNICATION WITH
HEAVEN

BEFORE THE radio was invented, it was impossible for man to send messages through space for any considerable distance. Sending an alarm or warning by whistle, beacon light, or other methods rarely exceeded more than a few miles. Since the invention of wireless communication by Guglielmo Marconi in 1895, the beginnings of modern radio, it has become possible for man to send a message through space all the way around the world. Not only that, with our advances in space science, we can even maintain direct contact with our man-made satellites by means of radio. Pioneer V, an American sun orbiter, is sending back radio signals from 24 million miles away. Astronomers have been detecting signals from radio stars millions of light

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years away. The giant 250-foot radio telescope being built near Sugar Grove, West Virginia, is said to be able to pick up signals emitted by stars 38 billion light years away.

We all know that to get a certain radio program on the air, all we have to do is to tune to the right frequency. If we still cannot get that particular program, the reason is that our radio set is not powerful enough to receive its weak signals. It is an established fact that we can receive any radio signal, no matter how faint it is, provided we have a powerful enough receiver to tune to the right frequency.

HOW DOES GOD HEAR OUR PRAYERS?

With the foregoing discussion we are now ready to discuss the important question: "How does God hear our prayers?" It is possible that the means God uses to hear our prayers are supernatural and that we can never understand them. On the other hand, He might be using means based on the existing natural laws, provided, of course, it is possible for Him to do so within the framework of natural laws. It is the author's belief that, in the main, God hears our prayers the same way that radio astronomers pick up signals from distant radio stars. The distance separating the two is about the same in both cases. In one case, the signals from radio

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stars, which are suns, are very powerful; in the other case, though the signals (our prayers) are weak, God has receivers of unlimited powers. Now it remains to prove that our prayers are very much like radio, i.e., electric waves.

THE ELECTRIC NATURE OF THE HUMAN BODY

Since the discovery of electricity, man has learned that matter is electrical in nature, and, furthermore, that practically all life processes are closely tied up with electric changes. Absorption of material through living cell membranes, muscular activity, and function of the nerve cells of the brain, all involve electricity. Thus cells customarily have an outside voltage 0.1 volt more positive than that inside. This is due to the unequal concentration of sodium and potassium ions on the two sides of the cell membrane.

The electrical currents in the muscle can be measured by the electrical device known as the electromyograph or EMG. Some years ago there appeared in the *Saturday Evening Post* an article describing such an experiment, part of which we quote below. It was done by injecting a needle into the tissues of a volunteer, in whom a nerve was deliberately cut. The electric currents picked up were amplified and made audible by a speaker.

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The experiment was performed for the purpose of determining whether the nerve would regenerate.

"Pattle, the physicist who had been working on the EMG equipment, was the first to volunteer. 'Go ahead and use me,' he said. 'I'm game.'"

"Fully realizing that something might go wrong—that the nerve might not grow back in his case—the student underwent the operation. While he was under anesthesia, a neat slit was made in his left forearm, two important nerves delicately exposed, and these were cut by a careful crushing procedure. Immediately the affected muscles leading to his left wrist and hand were paralyzed.

"At first, Pattle's muscles were not merely paralyzed, but also electrically dead. Instead of getting the normal 'pop-pop-pop' sounds from healthy tissue, the EMG could pick up no signals at all. This electrical silence lasted for more than two weeks. Then, on the eighteenth day, the machine detected the first signs of electrical activity, and out of the loud speaker came the constant noise of crackling paper.

"This crackling noise continued week after week. Today doctors realize it meant that the muscle had no nerve supply, but that the muscle fibers were still alive.

"On the fifty-fifth day, Pattle came in for his routine EMG test. Out of the loud speaker came the usual crackling noise—known technically as fibril-

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lation sounds—but with them was a new noise, a ‘chug-chug-chug’ like the sound of a tired automobile engine.

“That new chugging sound, it later became apparent, was the signal that the first delicate strands of regenerating nerve fibers had reached the muscle.

“‘It was another nine days, however, before the first clinical signs of recovery appeared,’ the scientists reported, ‘and twelve days before contraction was judged to be just sufficient to move the wrist.’

“In another two months the paralysis was practically gone.”

It has recently been found by Drs. W. K. Volkers and W. Candib of Schenectady, N. Y. that muscles broadcast not only relatively powerful signals (of a few hundred cycles per second as commonly used in diagnosis of the heart with the cardiograph), but also very weak, high frequency electrical signals. By using a new ultra-low-noise transistor amplifier, they picked up muscle signals up to 50,000 cycles per second frequency.

ELECTRIC ACTIVITY OF THE BRAIN

We have all heard that the human nervous system is very much like the telephone system, the nerves acting as the telephone lines and the brain as the switchboard. However, the brain is much more complicated than any electrical system that man

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can devise. To help us to realize how marvelous an electric machine our brain is, let us quote from Bruce Bliven's April, 1953, *Popular Science* article, "Your Brain is Like a Wet Cell Battery":

"The brain is often compared to an electric computing machine, but a computing machine as complicated as your brain would require a five-story building many blocks square, solidly filled with mechanism, and would need all the water of Niagara to cool the necessary tubes.

"Warren S. McCullough of the University of Illinois Medical School had calculated that the biggest computing machine ever constructed may be about equal to an ant's brain."

The brain is such a complicated organ because of the large number of cells it contains. The cerebrum, one of the three parts of the brain, contains as many as 15 billion cells.

That the brain gives off waves of electrical impulses at regular intervals was discovered by Hans Berger, a German psychiatrist. His study of brain waves resulted in the development of a new medical science called electroencephalography. By attaching electrode connections to the surface of the skull, a person's brain wave pattern, called an electroencephalograph, can be determined. Each person has his own pattern of shift in frequency of the electric pulsations and amplitude. The brain wave patterns also vary according to activities.

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Alpha rays are given off at the rate of ten a second when the brain is at rest. When the brain is active, beta rays are given off at a rate of about twenty-five a second. They are also affected by disease states. That is why the doctor can tell an epileptic from a normal person. According to Dr. Wilder Penfield, director of the Montreal Neurological Institute, "Epilepsy is literally an electrical explosion, brought on by a too heavy charge accumulating frequently in a damaged part of the brain."—*Reader's Digest*, July, 1958.

In this connection, we wish to quote the following almost unbelievable account told by Dr. N. Jerome Stowell, a nuclear scientist in Southern California, which changed him from an atheist to a strong believer in God:

"I was almost a devout atheist. I didn't believe that God was any more than a conglomeration of everyone's mind put together, and the good that was there—that was God as far as I was concerned. As for the real, all-powerful God existing and loving us all, with power over everything, I didn't believe that!

"Then one day I had an experience that really set me thinking. I was in a large pathological laboratory and we were attempting to find the wave-length of the brain. We found more than just a wave-length of the brain. We found a channel of wave-lengths, and that channel has so much room

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in it that the different wave-lengths of each individual brain are farther separated in identity than the fingerprints on each individual's hand. This is a point we should remember: God can actually keep in heaven a record of our thoughts as individuals just as the F.B.I. can keep a record of our fingerprints in Washington, D. C.

"We wanted to make an experiment to discover what took place in the brain at the moment of transition from life to death. We chose a lady whose family had sent her to a mental institution, but who had been discharged. The doctors could find nothing wrong with her other than the fact that she had cancer of the brain. This affected the balance of her body only. As far as her alertness of mind was concerned, and in every other way, she was exceptionally brilliant. But we knew that she was on the verge of death, and she was informed in this research hospital that she was going to die.

"We arranged a tiny pickup in her room to ascertain what would take place in the transition of her brain from life to death. We also put a very small microphone, about the size of a shilling, in the room, so that we could hear what she said if she had anything to say.

"Five of us hardened scientists—perhaps I was the hardest and most atheistic of the group—were in an adjoining room with our instruments prepared to register and record what transpired. Our device

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had a needle pointing to 0 in the center of the scale. To the right the scale was calibrated to 500 points positive. To the left the scale was calibrated to 500 points negative. We previously had registered on this identical instrument the power used by a 50 kilowatt broadcasting station in sending a message around the world. The needle registered 9 points on the positive side.

"As the last moments of this woman's life arrived, she began to pray and to praise the Lord. She asked the Lord God to be merciful unto those who had despitefully used her. Then she reaffirmed her faith in God, telling Him she knew He was the only power and that He was the living power. She told God He always had been, and always would be. She praised God and thanked Him for His power and for her knowledge of His reality. She told Him how much she loved Him!

"We scientists had been so engrossed with this woman's prayer that we had forgotten our experiment. We looked at each other and saw tears streaming down scientific faces. I had not shed tears since I was a child.

"Suddenly we heard a clicking sound on our forgotten instrument. We looked and the needle was registering a positive 500, desperately trying to go higher, only to bounce against the 500 positive post in its attempt!

"By actual instrumentation we had recorded that

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the brain of a woman, alone and dying, in communication with God had registered more than fifty-five times the power used by a fifty kilowatt broadcasting station sending a message around the world.

"After this, we decided to try a case very unlike the first one. We chose a man lying in the research hospital, stricken with a deadly social disease. His brain had become atrophied to the very point of death. He was practically a maniac.

"After we had set up our instruments, we arranged for one of the nurses to antagonize the man. Through her wiles she attracted his interest in her, and then suddenly told him she didn't want to have anything more to do with him. He began to verbally abuse her and the needle began to register on the negative side. Then he cursed her and took the name of God in vain. The needle clicked back and forth against the 500 negative post.

"By actual instrumentation we had registered what happened in the brain when that brain broke one of God's Ten Commandments, 'Thou shalt not take the name of the Lord thy God in vain.'

"We had established by instrumentation the positive power of God and the negative power of the adversary. We had found that beneficial truth is positive and that non-beneficial things, covered by the 'thou shalt nots' of the Ten Commandments, are negative in varying degrees.

"If we scientists can record these things, I believe

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with all my heart that the Lord God can keep a record of our thoughts! He has more power than we have, and is a better record keeper than any of us on this earth.”—George Burnside, *Buried Evidence*, pp. 54-57.

The scientific findings presented above and certain Scriptural evidence led the author to believe in the following:

Man's prayers, whether audible or silent, reach God through the radio-like electric waves generated in the brain. Even though man's brain waves are too feeble for detection by any man-made scientific instruments existing today, except by direct electrode contact, our omnipotent God has sufficiently powerful means—call them receivers if you wish—to receive man's prayer message in heaven.

Men's ordinary thoughts also generate brain waves that reach heaven. They are recorded by each individual recording angel (Matthew 18:10) in the books of heaven (Revelation 20:12). It is these thought patterns which represent motives, rather than outward appearances, acts, or words, that are recorded (I Samuel 16:7; Matthew 15:18), for the sounds of words cannot be propagated to any great distances. However, thoughts, where words originate, can be propagated to distant regions through their brain waves. It is through these electric brain waves that “the Lord knoweth the thoughts of man” (Psalm 94:11). Thoughts,

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not words, determine what a man is. "For as a man thinketh in his heart [meaning mind (Psalm 33:11; Luke 2:35)], so is he" (Proverbs 23:7).

While men use magnetic tapes for recording, angels use books, which are actually superior to tapes, as the following illustration will show. Suppose a weather man had a year's weather reports recorded on a tape. If someone should ask him to play back the weather report of a certain date, as those who have used a tape recorder already know, it would take a long time—in running back and forth, playing and rewinding—to locate that particular report. However, if he had recorded his weather reports on ferric oxide-coated magnetic pages which are dated and filed in a loose-leaf book, it would be an easy matter to locate that particular page. As a matter of fact, a talking dictionary based on this idea has been invented. The pronunciation of each word is recorded on each individual card, which can be easily filed and used. Also, one of the memory-storing computer manufacturers is using magnetic cards rather than tapes for more efficient handling of data.

The Bible tells us that on the judgment day, "ten thousand times thousands [angels] stood before Him: the judgment was set, and the books were opened" (Daniel 7:10). "Since the angels are our ministering spirits, and our lives are open to them, it is reasonable to infer that they make the record of

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our lives. Then when the books are examined, they will of necessity be present, to minister before God.” —*Bible Readings for the Home*, page 485.

Now suppose on the judgment day a sinner denied the charge that at a certain birthday party which he attended, he was infatuated with the pretty hostess and committed adultery in his mind (Matthew 5:28), and demanded proof. It would be a difficult task for the recording angel to locate that particular incident if the recordings were made on a tape, but it would not be much of a task to locate it in a loose-leaf book, and to take out the page and put on the recorder to play it back to the speechless sinner.

Someone may question the possibility of recording the thoughts of the whole world's population of nearly three billion people. Actually this is not such a difficult task because it has been found that electroencephalograph charts of human brains are as distinct as fingerprints, and for this reason they have been called “brainprints.” Let us read what W. Grey Walter wrote about these brainprints in 1954: “Today several hundred laboratories in the United States and a similar number in Europe are recording and interpreting charts of the electrical discharges of human brains. Their total annual output of charts would girdle the earth. Hospitals all over the world have accumulated thousands upon thousands of brainprints . . . Each individ-

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ual has his own characteristic pattern of shifts in frequency and size; thus his brainprint is as distinctive as his signature."—*Scientific American*, June, 1954, pp. 54, 55.

If we can select our station or program from hundreds and thousands that are on the air by tuning, why can't the angels in heaven do the same? In fact, the very word "tune" as well as the word "broadcast" have been used by scientists in connection with brain waves. The following is from a news report: "Scientists have been able to *tune* in on the electrical activity of single nerve cells in the brain," Dr. Edward V. Evarts of the National Institute of Mental Health reported.

"The 'brain waves' that have been studied by scientists in recent years result from the signals '*broadcast*' by many nerve cells sending out impulses in unison."—*Science News Letter*, May 7, 1960 (Italics supplied).

GOD'S WAY OF COMMUNICATING WITH MAN

A good prayer consists of two parts: we talk to God, and God talks to us. We have shown that it was the electrical waves of the brain that sent our prayer thoughts heavenward; likewise, heaven communicates with us through the same medium. Ellen G. White wrote: "The brain nerves that connect

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with the whole system are the medium through which Heaven communicates with men, and affects the inmost life. Whatever hinders the circulation of the electric current in the nervous system . . . makes it most difficult to arouse the moral nature.” —*Education*, page 209.

Again, “The brain nerves which communicate with the entire system are the only medium through which Heaven can communicate to man, and affects the inmost life. Whatever disturbs the circulation of the electric currents in the nervous system lessens the strength of the vital powers, and the result is a deadening of the sensibilities of the mind.”—*Testimonies*, Vol. 2, page 347.

While God hears our prayers originated from our brains and angels record our thoughts, it is the Holy Spirit who impresses our minds. So here we have a two-way communication between God and man made possible by the electric current in our brain.

Chapter 11

THE UNIFYING PRINCIPLE

THERE ARE three physical phenomena in nature which resemble one another in some respects and differ in others.

First, there is the phenomenon of gravitational attraction. According to Newton's law of universal gravitation, every particle of matter in the universe attracts every other particle with a force which is directly proportional to the product of the masses of the particles and inversely proportional to the square of the distance between them. It may be represented by the following equation :

$$F = G \frac{m \ m'}{d^2}$$

where F is the force of attraction, m the mass of one object, m' that of the other, d the distance between them, and G the gravitational constant.

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Next, we have the phenomenon of electric force. According to Coulomb's law, the force of attraction exerted on one charged body by another is proportional to the product of their charges and inversely proportional to the square of the distance between them. This law may be represented by the following equation:

$$F = C \frac{q q'}{d^2}$$

where F is the force of attraction, q the amount of positive charge, q' the amount of negative charge, d the distance between them, and C a proportionality constant.

Last, we have the phenomenon of magnetic force. The law governing this force states that the force of attraction between two unlike magnetic poles is directly proportional to their strength and inversely proportional to the square of the distance between them. In the form of an equation, it is:

$$F = K \frac{M M'}{d^2}$$

where F is the force of attraction, M the pole strength of the north magnetic pole, M' that of the south magnetic pole, d the distance between them, and K a proportionality constant.

A comparison of these three forces shows that they are similar in that all can attract. They are different in that, although gravitational forces can

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only attract, electric and magnetic forces can repel as well as attract. If the electric charges are both positive or both negative, the charges will repel each other. Similarly, if the magnetic poles are both north or both south, they will repel each other. However, as the above equations indicate, these three forces are so similar that many scientists have been led to believe that all these forces are branches of a more fundamental phenomenon in nature. Efforts to unify these and other phenomena of nature have been made from time to time. In March, 1953, Dr. Einstein partially succeeded in deriving a single mathematical formula which includes the laws of gravitation, electromagnetism, and relativity. Later in 1958 Dr. Werner Heisenberg, Nobel prize-winner and Director of Max Planck Institute for Physics, Munich, Germany, announced that he had developed a new, all-embracing theory of the elementary particles, which he hopes will offer a thorough mathematical analysis leading to a derivation of the properties of these particles, and thereby to a unified field theory. The unified field theory is so-called because it concerns itself with fields, the regions between masses, charges, and magnetic poles in which the interactions take place. In spite of what has been claimed, man's hope of unifying all these phenomena of nature is still unfulfilled.

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THE STRUCTURAL UNITS OF THE ATOM

Before the discovery of the electron in 1897 and the subsequent discovery of the proton and the neutron, chemists only knew that the countless forms of matter existing on the earth and in the universe were composed of some 90 different chemical elements. What the elements were made of and the basic differences between different elements, they did not know. After the discovery of these fundamental particles and the advancement of the Bohr theory, scientists came to the conclusion that the atoms of various elements are very much like the solar system. In the center of each atom is the nucleus consisting of neutrons and positively-charged protons. Revolving around the nucleus in various orbits at great distances are negatively-charged electrons, equal in number to the number of protons in the nucleus. Elements differ from each other only in the numbers of protons and neutrons in the nucleus and in the number of electrons in the orbits. Thus the hydrogen atom has one proton (the only element that does not have any neutrons) in the nucleus and one electron in the orbit; the helium atom has two protons and two neutrons in the nucleus and two electrons in the orbit; the lithium atom has three protons and four neutrons in the nucleus and three

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electrons in the orbits, two in the first orbit close to the nucleus and one in the second orbit farther out. The number of protons increases one by one until we come to the ninety-second element, uranium, which contains 92 protons and 146 neutrons in the nucleus and 92 electrons in seven different orbits with the following electron distribution in them: 2, 8, 18, 32, 21, 9, 2.

Since all the different elements are made up of the same fundamental units of protons, neutrons, and electrons, it is possible by subtraction and addition of a number of these units to change one element to another or make new ones that have never been known before. Such nuclear reactions actually take place in the so-called atom smashers, nuclear reactors, and exploding atomic or hydrogen bombs. Thus when a hydrogen bomb explodes, four atoms of hydrogen fuse together to form one atom of helium with the liberation of a large quantity of energy. This same reaction is believed to take place on the surface of the sun.

It has also been shown that heavier elements can be built up from lighter ones by bombarding the latter with protons (nuclei of hydrogen atoms), alpha-particles (nuclei of helium atoms), and similar projectiles. Thus, heavier nitrogen atoms have been formed from the lighter carbon atoms by bombarding the latter with protons; so also the heavier oxygen atoms from the lighter nitrogen atoms with

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alpha-particles. The eleven new elements beyond uranium, from element 93, neptunium, to the last element 103, lawrencium, were all made by such processes.

Thus we see that all the elements can be built from the three fundamental building blocks—the proton, the neutron, and the electron. Since the neutron by losing an electron can become a proton, it is believed to be a sort of combination of a proton and an electron. Accordingly, we may say that there are only two building blocks which make up all forms of matter, namely, the positively-charged protons and the negatively-charged electrons. Their attraction for each other accounts for the stability of the atoms. Here then is another phenomenon that resembles the three other phenomena discussed above, and it should be included in any unified field theory.

LOVE, THE UNIFYING PRINCIPLE

So far we have been discussing only the physical. Yet, life consists of the spiritual as well as the physical. Can there be a unifying principle that embraces both the physical and the spiritual? The author believes there is, and this unifying principle is love.

Over fifty years ago Dr. Charles Steinmetz, the famed electrical wizard of General Electric, said,

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"We have studied the laws of matter. Fifty years from now the world will be studying the laws of spirit. They will take love into the laboratory and find more power in love than there is in electricity."

Since God is love (1 John 4:8) and God is also the creator of all natural phenomena and natural laws, we see that love and physical phenomena have the same origin. And love resembles these physical forces of attraction which we have been discussing in that it also attracts. Speaking of His love for Israel, God said through Hosea, "I *drew* them with cords of a man, with bands of love" (Hosea 11:4). Again He said through Jeremiah, "Yea, I have loved thee with an everlasting love; therefore with loving-kindness have I *drawn* thee" (Jeremiah 31:3). Preaching to the multitude one day Jesus said, "Nobody comes to me unless he is *drawn* to me by the Father who sent me" (John 6:44.¹ He said on another occasion, "And I, if I be lifted up from the earth, will *draw* all men unto me." (John 12:32).

Human love also attracts. In Genesis 2:23 we read: "Therefore shall a man leave his father and his mother, and shall *cleave* unto his wife: and they shall be one flesh." No one has proved the existence of "animal magnetism," but the attraction between opposite sexes is evident everywhere.

Many of the readers have undoubtedly read the

1. From *The New Testament in Modern English*, copyright J. B. Phillips 1958. Used by permission of The Macmillan Company.

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story of Ruth, particularly the following conversation between Naomi and her two daughters-in-law: "And they lifted up their voice, and wept again: and Orpah kissed her mother in law; but Ruth *clave* unto her . . . And Ruth said, Intreat me not to leave thee, or to return from following after thee: for whither thou goest, I will go; and where thou lodgest, I will lodge: thy people shall be my people, and thy God my God" (Ruth 1:14, 16).

Just as there are four different types of forces of attraction—electric, magnetic, gravitational, and atomic, there are four kinds of love—love between God and man, love between parents and children, love between husbands and wives, and love of man for his fellow man.

The greatest physical force of attraction is what holds the protons and neutrons together within the nucleus of the atom, sometimes referred to as nuclear energy. Atomic energy is nuclear energy when it is released from the nucleus. Its tremendous power as compared to ordinary forms of energy is known to all.

In the spiritual realm, the greatest love is the love of God in giving His son and the love of Jesus in sacrificing His life on Calvary's cross. "For God so loved the world, that He gave his only begotten Son, that whosoever believeth in him should not perish, but have everlasting life" (John 3:16).

A good Christian reciprocates his love to God ac-

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ording to Christ's injunction: "Thou shalt love the Lord thy God with all thy heart, and with all thy soul, with all thy mind, and with all thy strength" (Mark 12:30).

We have learned that there is nothing on earth that can shield gravity. Neither can anything shield the sons of God from the love of Christ. Solomon said, "Many waters cannot quench love, neither can the floods drown it" (Song of Solomon 8:7). Paul said, "Who shall separate us from the love of Christ? shall tribulation, or distress, or persecution, or famine, or nakedness, or peril, or sword? . . . For I am persuaded, that neither death, nor life, nor angels, nor principalities, nor powers, nor things present, nor things to come, nor height, nor depth, nor any other creature, shall be able to separate us from the love of God, which is in Christ Jesus our Lord" (Romans 8:35, 38, 39).

Indeed, for the millions of Christians who suffered a martyr's fate during the Middle Ages, no amount of persecution or death was able to separate them from the love of Christ. Many reformers like Jerome, Huss, Tyndale, Wishard, Granmer, Latimer, and Ridley were burned at the stake. Others were eaten by ravenous beasts in the crowd-packed Colosseum. Still others were tortured in the Inquisition cells or cut down by the sword. The Albigenes, Waldenses, Huguenots, and Lollards were dealt the heaviest blow. It is heartening, however, to

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note the reward promised them by the Lord: "Be thou faithful unto death, and I will give thee a crown of life" (Revelation 2:10).

Next, there exists the love between parents and children. Many a robin or other animal has died for its helpless young. Many a mother has sacrificed her own life while rescuing her children from a burning home.

To give opportunity to the young to respond to a mother's love is also important. Dr. Ashley Montague, of the New School for Social Research, makes this observation: "To inhibit or prevent the expression of love is to do violence to the needs, to the structure, and to the functioning of the organism. To love and to be loved is as necessary to the organism as to the breathing of air."—Quoted by John B. Magee, *Reality and Prayer*, page 63.

Newborn babies even detect mother's love in her heart beat. *Scope* reports that the sound of a mother's heart—tape recorded and played back through loud-speakers in a hospital nursery—apparently helps newborn babies gain weight, avoid stomach upset, and cry less.

The love between the husband and the wife or between lovers before they are married is more like the electric attraction between the positive and the negative charges or the magnetic attraction between the north and south poles.

Because the love between husband and wife is the

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most understood love on earth, the Bible often uses it to illustrate Christ's love for His church. Says Paul, "Husbands, love your wives, even as Christ also loved the church, and gave himself for it. . . . So ought men to love their wives as their own bodies. He that loveth his wife loveth himself" (Ephesians 5:25, 28). John the revelator uses the similar analogy in describing the New Jerusalem. "And I John saw the holy city, new Jerusalem, coming down from God out of heaven, prepared as a bride adorned for her husband (Revelation 21:1).

According to Jesus' broad classification, love is of two kinds—love for God and love for men, for in Matthew 22:37-40 we read: "Jesus said unto him, Thou shalt love the Lord thy God with all thy heart, and with all thy soul, and with all thy mind. This is the first and great commandment. And the second is like unto it, Thou shalt love thy neighbor as thyself. On these two commandments hang all the law and the prophets."

The relationship between love for God and love for men is pointed out by John who said, "Beloved, let us love one another: for love is of God, and every one that loveth is born of God, and knoweth God. He that loveth not knoweth not God, for God is love. In this was manifested the love of God toward us, because that God sent his only begotten Son into the world, that we might live through him. Herein is love, not that we loved God, but that he

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loved us, and sent his Son to be the propitiation for our sins. Beloved, if God so loved us, we ought also to love one another. No man hath seen God at any time. If we love one another, God dwelleth in us and his love is perfected in us" (1 John 4:7-11).

It is one thing to love our friends and people we like, but it is another thing to love those we do not like, especially our enemies. But this is what makes Christianity surpass other religions. Jesus said to His disciples, "Ye have heard that it hath been said, Thou shalt love thy neighbor, and hate thine enemy. But I say unto you, Love your enemies, bless them that curse you, do good to them that hate you, and pray for them which despitefully use you, and persecute you." (Matthew 5:44). Jesus illustrated this principle in the following recorded conversation with Peter: "Then came Peter to him, and said, Lord, how oft shall my brother sin against me, and I forgive him? till seven times? Jesus saith unto him, I say not unto thee, Until seven times: but, Until seventy times seven" (Matthew 18:21, 22). One of the last prayers Jesus ever offered was offered on the cross for his enemies. "And when they were come to the place, which is called Calvary, there they crucified him. . . . Then said Jesus, Father, forgive them; for they know not what they do" (Luke 23:33). What an example!

We have learned earlier that from the positively-

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charged protons and the negatively-charged electrons are derived all the 103 chemical elements and that of these all other forms of matter are composed. So is love, for Paul says, "Love is the golden chain of all the virtue" (Colossians 3:14).² Thus from love for God are sprung obedience, allegiance, reverence, etc., and from love for fellow men are sprung kindness, sympathy, compassion, etc. There is hardly any virtue but that can be related to love as the unifying principle. To end this chapter the author can think of no more fitting way than to relate Paul's great dissertation on love as recorded in the thirteenth chapter of the first book of Corinthians:—

"If I were to speak with the combined eloquence of men and angels I should stir men like a fanfare of trumpets or the crashing of cymbals, but unless I had love, I should do nothing more. If I had the gift of foretelling the future and had in my mind not only all human knowledge but the secrets of God, and if, in addition, I had that absolute faith which can move mountains, but had no love, I tell you I should amount to nothing at all. If I were to sell all my possessions to feed the hungry and, for my convictions, allowed my body to be burned, and yet had no love, I should achieve precisely nothing.

2. From *The New Testament in Modern English*, copyright J. B. Phillips 1958. Used by permission of The Macmillan Company.

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"This love of which I speak is slow to lose patience—it looks for a way of being constructive. It is not possessive: it is neither anxious to impress nor does it cherish inflated ideas of its own importance.

"Love has good manners and does not pursue selfish advantage. It is not touchy. It does not keep account of evil or gloat over the wickedness of other people. On the contrary, it is glad with all good men when truth prevails.

"Love knows no limit to its endurance, no end to its trust, no fading of its hope; it can outlast anything. It is, in fact, the one thing that still stands when all else has fallen.

"For if there are prophecies they will be fulfilled and done with, if there are 'tongues' the need for them will disappear, if there is knowledge it will be swallowed up in truth. For our knowledge is always incomplete and our prophecy is always incomplete, and when the complete comes, that is the end of the incomplete.

"When I was a little child I talked and felt and thought like a little child. Now that I am a man my childish speech and feeling and thought have no further significance for me.

"At present we are men looking at puzzling reflections in a mirror. The time will come when we shall see reality whole and face to face! At present all I know is a little fraction of the truth, but the

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time will come when I shall know it as fully as God now knows me!

“In this life we have three great lasting qualities—faith, hope and love. But the greatest of them is love.”³

3. From *The New Testament in Modern English*, copyright J. B. Phillips 1958. Used by permission of The Macmillan Company.

Chapter 12

TWO INDISPUTABLE SIGNS

“LET NOT your heart be troubled: ye believe in God, believe also in me. In my father’s house are many mansions: if it were not so, I would have told you. And if I go and prepare a place for you, I will come again, and receive you unto myself; that where I am, there ye may be also” (John 14: 1-3).

“And then shall appear the sign of the Son of man in heaven: and then shall all the tribes of the earth mourn, and they shall see the Son of man coming in the clouds of heaven with power and great glory” (Matthew 24:30).

“For the Lord himself shall descend from heaven with a shout, with the voice of the archangel, and with the trump of God; and the dead in Christ shall rise first” (1 Thessalonians 4:16).

“Behold, he cometh with clouds; and every eye shall see him, and they also which pierced him: and

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all kindreds of the earth shall wail because of him. Even so, Amen" (Revelation 1:7).

"And when he had spoken these things, while they beheld, he was taken up; and a cloud received him out of their sight. And while they looked stedfastly toward heaven as he went up, behold, two men stood by them in white apparel; which also said, Ye men of Galilee, why stand ye gazing up into heaven? this same Jesus, which is taken up from you into heaven, shall so come in like manner as ye have seen him go into heaven" (Acts 1:9-11).

These are but a few of the many Bible texts referring to the return of our Lord to this earth the second time to end this world of sin.

"The second coming of Christ," writes Oscar Lowry, "is mentioned over 300 times in the New Testament. On an average, one out of every twenty-five verses from Matthew to Revelation refers to the second coming of Christ. There are more than 300 distinct prophecies in the Old and New Testament relating to the second coming of Christ. For each time the atonement is mentioned, the second coming is spoken of twice. For each time the first coming is mentioned, the second coming is mentioned eight times. . . . Paul mentioned baptism but fifteen times, but he mentioned the second coming 55 times. . . . If a doctrine is to be considered important because of its prominence in the Scriptures, then the second coming of our Lord

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stands paramount in the list and is second to none—not even the atonement. The greatest thing that will ever take place in the history of this world will be the personal return of our Lord Jesus Christ; therefore we should not be surprised to find so much of the Bible given over to a consideration of this, the greatest of great events.”—*The Second Coming of Christ*, pp. 7, 8.

SIGNS OF THE SECOND COMING

The Bible foretold many signs by which God’s people may know the time when the second coming of Christ is near at hand. The few outstanding ones are as follows:

“And as he sat upon the mount of Olives, the disciples came unto him privately, saying, Tell us, when shall these things be? and what shall be the sign of thy coming, and of the end of the world? And Jesus answered and said unto them, Take heed that no man deceive you. . . . And ye shall hear of wars and rumours of wars. . . . For nation shall rise against nation, and kingdom against kingdom: and there shall be famines, and pestilences, and earthquakes, in divers places” (Matthew 24:3-7).

“And there shall be signs in the sun, and in the moon, and in the stars; and upon the earth distress of nations with perplexity; the sea and the waves roaring; men’s hearts failing them for fear, and for look-

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ing after those things which are coming on the earth: for the powers of heaven shall be shaken. And then shall they see the Son of man coming in a cloud with power and great glory. And when these things begin to come to pass, then look up, and lift up your heads; for your redemption draweth nigh" (Luke 21:25-28).

"This know also, that in the last days perilous times shall come. For men shall be lovers of their own selves, covetous, boasters, proud, blasphemers, disobedient to parents, unthankful, unholy, without natural affection, truce-breakers, false accusers, incontinent, fierce, despisers of those that are good, traitors, heady, highminded, lovers of pleasures more than lovers of God; having a form of godliness, but denying the power thereof: from such turn away" (2 Timothy 3:1-5).

Other signs of the times include the conflict between capitalism and labor (James 5:1-6), and the spread of spiritism (1 Timothy 4:1, 2).

In regard to these signs, many argue that none of them is distinct for the present time. Their arguments run something like this. The lawlessness and abounding iniquity of the last days were paralleled in the antediluvian world, which brought on the flood, and the wickedness of Sodom and Gomorrah, which caused their destruction. The human race has always had its wars, pestilences, famines, and earthquakes. Their seeming increase in frequency

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in the 19th century was due to better means of news-gathering and reporting aided by the modern methods of communication and transportation. The darkening of the sun and the moon occurred even at the time of the Babylonians (Isaiah 13:10), and the falling of stars was merely a periodic astronomical phenomenon (Leonid meteor showers occur every 33 years). Other arguments of this nature exist.

While all these arguments can be countered with convincing evidence of their superficiality, we shall pass them by because a detailed discussion of them will take us far afield, especially when they are not within the province of this volume. We shall therefore limit our discussion to two indisputable signs of the times which have had no parallel in human history and in which science plays a major part.

RUNNING TO AND FRO

Among other things, this modern age in which we live is characterized by two phenomena—unparalleled travel and rapid increase of knowledge. According to Daniel 12:4, these are distinct signs of the time of the end of the world's history, hence signs of the second coming of Christ. It states, "But thou, O Daniel, shut up the words, and seal the book, even to the time of the end: many shall run to and fro, and knowledge shall be increased."

Rapid transportation is of fairly recent develop-

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ment. Prior to 1800 the fastest speed that man could attain during the six millenniums of human history was the speed of a horse, which was about 25 miles per hour. That was the fastest speed of travel capable at the time when Columbus discovered America, that was the speed of Paul Revere's ride in 1775, and that was the top speed of the Pony Express of the 1860's, a mail-carrying service operating between St. Joseph, Missouri and Sacramento, California. Incidentally, that was the speed of the Romans almost 2,000 years before.

Even only a hundred years ago man was so unaccustomed to speed that people regarded as incredible any mechanical contrivance that could be invented to travel at the speed of even twelve miles per hour. In 1825 Nicholas Wood, in his work on railroads, said: "Nothing could do more harm toward the adoption of railways than the promulgation of such nonsense as that we shall see locomotives traveling at the rate of twelve, sixteen, eighteen, and twenty miles an hour." In 1828 the school board in Lancaster, Ohio, denied the use of the school house by a debating society for the discussion of railways and gave the following reason for the refusal:

"You are welcome to use the school to debate all proper questions in; but such things as railroads and telegraphs are impossibilities and rank infidelity. . . . If God had designed that His intelligent creatures should travel at the frightful speed of fifteen

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miles an hour by steam, He would have clearly foretold it through His holy prophets. It is a device of Satan to lead immortal souls down to hell."

However, from 1800 on, great strides in transportation suddenly began to be made. The invention of the steam engine, electric motor, and internal combustion engine came in rapid succession, making possible transportation by steamboat, train, automobile, and airplane. More recently jet propulsion and atomic power made possible jet and nuclear submarine travel.

As a result of these inventions, the speed of travel had skyrocketed to dizzy heights. George Stevenson's locomotive named "Rocket" of 1829 attained a speed of only 30 miles an hour. Military planes during World War I had a speed of only 42 miles an hour, but by the beginning of World War II, the speed of airplanes had increased to 200 miles an hour. However, the great change came in 1945 when a speed of 606 miles an hour was attained. This was followed by the break-through of the sound barrier in 1947 by the rocket-engine-powered Bell X-1. (The speed of sound is roughly 700 miles an hour, the exact figure depending on the temperature of the air and elevation.)

By 1956 the speed of planes had gone beyond 1,000 miles an hour. On March 10 of that year Lionel Peter Twiss, who flew a British Fairey Delta 2, set a speed record of 1,132 miles per hour. This

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record was quickly broken in December, 1957, by Major Adrain E. Drew of the U. S. Air Force, who flew a McDonnell F-101A at the speed of 1,207 miles per hour. But this record in turn was broken in May, 1958, by Captain Walter W. Irwin, flying a Lockheed F104 at 1,404 miles per hour. This was followed by a new record set by Major Joseph W. Rogers of the U. S. Air Force on December, 1959, who flew a F-106A Delta Wing Monoplane at the speed of 1,526 miles per hour.

More recently the X-2 achieved a speed of 2,200 miles per hour. The X-15, flown by Major Robert White of the U. S. Air Force on November 9, 1961, attained a speed of 4,070 miles per hour, nearly six times the speed of sound.

Thus we see the high speed of transportation has made the fulfillment of "many shall run to and fro" possible. A hundred years ago, ten miles meant either a long walk or horseback ride for the farm boy. Now it means only a few minutes' ride in an automobile. Columbus with his three ships spent seventy days sailing from Spain to the West Indies. Now a fast trans-Atlantic liner crosses the ocean in three days, and a jet plane makes the crossing in a few hours. People are now traveling everywhere: on the earth by automobiles, trains, and buses; over the earth by planes and jets; under the earth by the same means of land transportation in tunnels, tubes, and subways; on the sea by ships; over the sea

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by planes and jets; and under the sea by submarines. Men are running to and fro, going here and there to all the ends of the world, fulfilling the ancient prophecy spoken by Daniel over twenty-five hundred years ago, their actions thereby pointing with precision to this day of ours as "the time of the end."

The rapid transportation has made today's world shrink in distance. When Magellan circumnavigated the world in 1519, it took him 1,083 days. This slow rate of travel was markedly cut to 40 days in 1911 by Colonel Burnlay Campbell, who made the trip by both boat and rail. Then in 1926 Edward Evans and Linton Wells made the round-the-world trip by boat, rail, and plane from New York in 28 days. Three years later, the German dirigible Graf Zeppelin from Lakehurst, New Jersey, made the trip in 21 days. In 1933 Wiley Post, who was later killed with Will Rogers in a plane crash near Point Barrow, Alaska, made the trip by plane in 7 days, 18 hours and 50 minutes. But in January, 1957, Major General Archie J. Old, Jr. of the U. S. Air Force made the first round-the-world nonstop jet plane flight in only 45 hours and nineteen minutes.

It was only by such rapid transportation that events like the following could have happened.

Not long ago a girl boarded a jet plane in Chicago. Before the plane left, her father reminded her at the airport to be sure to make a long distance

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call home when she arrived in San Francisco. After the plane left, this man went back to his home, which was located in a small town about 90 miles away. Just as he entered the house, the phone rang. On the other end of the line was his daughter telling him of her safe arrival in San Francisco.

During the worst airplane strike in the history of the United States, which caused the cancellation of practically all domestic air flights, a business man in Los Angeles successfully made his trip to New York by way of Copenhagen via foreign airlines. He would have missed his business appointment by riding on the train.

The earth rotates on its axis eastward once every 24 hours. This movement is what makes the sun appear to rise in the east and set in the west. Since the circumference of the earth around the equator is about 25,000 miles, the earth rotates at the rate of over 1,000 miles an hour. Roughly then, for two cities 1,000 miles apart, there is one hour's difference in time. New York and Los Angeles are about 3,000 miles apart; hence there is a time difference of three hours. When it is 12 o'clock noon Eastern Standard Time in New York, it is 9 a.m. Pacific Standard Time in Los Angeles. For this reason, people traveling from New York to Los Angeles will gain three hours, while people traveling in the opposite direction will lose three hours. A jet plane traveling at 600 miles an hour will re-

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quire five hours of actual flying time to make the trip from New York to Los Angeles. But because of the three-hour gain, a jet leaving New York at noon Eastern Standard Time will arrive at Los Angeles at 2 p.m. Pacific Standard Time, a difference of only two hours clock time.

Supposing a jet is traveling at 1,000 miles an hour, the same speed at which the sun appears to move westward. If it left New York at noon with the sun overhead, it would arrive at Los Angeles also at noon with the sun overhead. Furthermore, the sun overhead would appear at a standstill all the way from New York to Los Angeles. You will recall that this was exactly what happened to the children of Israel when Joshua defeated the five kings. Here is the story as recorded in Joshua 10:12-14. "Then spake Joshua to the Lord in the day when the Lord delivered up the Amorites before the children of Israel, and he said in the sight of Israel, Sun, stand thou still upon Gibeon; and thou, Moon in the valley of Ajalon. And the sun stood still, and the moon stayed, until the people had avenged themselves upon their enemies. . . . So the sun stood still in the midst of heaven, and hasted not to go down about a whole day. And there was no day like that before it or after it, that the Lord hearkened unto the voice of a man: for the Lord fought for Israel."

Now suppose the jet travels westward faster

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than 1,000 miles an hour so that it overtakes the sun. Then what will happen? The sun will appear to set in the east rather than in the west. Incidentally, this also happened in Bible times. When king Hezekiah was sick unto death and asked the prophet Isaiah for a sign that the Lord would heal him and lengthen his life, "Isaiah said, This sign shalt thou have of the Lord, that the Lord will do the thing that he hath spoken: shall the shadow go forward ten degrees, or go back ten degrees? And Hezekiah answered, It is a light thing for the shadow to go down ten degrees: nay, but let the shadow return backward ten degrees. And Isaiah the prophet cried unto the Lord: and he brought the shadow ten degrees backward, by which it had gone down the dial of Ahaz" (2 Kings 20:9-11). The sun had to move from west to east in order to reverse its shadow on the sun dial. How that was accomplished by the Lord, no one knows, though there have been many speculations.

Another strange phenomenon should be mentioned in connection with overtaking the sun by a jet or other vehicles. If our jet, traveling at more than 1,000 miles an hour, had left New York shortly before midnight so that Monday had just begun, it would arrive at Los Angeles on Sunday, the day before it started its trip. That this is entirely possible can be seen from the speed records we cited earlier. An extraordinary world we are living in!

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The vehicles of transportation discussed above were all controlled by man and traveling inside the earth's atmosphere. However, since the space age began on October 4, 1957, when the Russians launched their first Sputnik, man-made speeds have risen to fantastic figures. In order to send a satellite into orbit, it is necessary to develop a speed of about 5 miles per second, or 18,000 miles per hour. This is the speed at which most of the man-made satellites now in orbit are traveling. They are traveling around the earth because they are not going too fast to overcome the earth's gravitational pull.

If, however, we wish to send a space ship to the moon or another planet, or have it go into orbit around the sun, then it is necessary to increase the speed to the earth's escape velocity of 7 miles per second, or 25,000 miles per hour. This was the minimum speed required to put the Russian Lunik I and American Pioneers IV and V in orbit around the sun, and to launch the Russian Lunik II which hit the moon and Lunik III which photographed the far side of the moon, and the 7.1 ton Sputnik V, a Venus probe.

Thus in a short space of about 150 years man has increased his speed from 25 miles an hour to 25,000 miles an hour, a thousand-fold increase in speed, and most of that increase was made in the last few

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years. "To the time of the end: men shall run to and fro." What fulfillment of Bible prophecy!

THE INCREASE OF KNOWLEDGE

The sudden increase of knowledge at the beginning of the "time of the end," around the year 1798, was described by Norman Cousins as follows:

"A wheel turned no faster in Hannibal's time than it did in George Washington's. It took just as long to cultivate a wheat field in Egypt in 5,000 B. C. as it did anywhere at the turn of the nineteenth century. . . . The speed of technological change was almost as slow as that of life itself. Then suddenly, with the utilization of steam and electricity more changes were made in technology in two generations than in all the thousands of years of previous human history put together. Wheels and machines turned so fast that man could cover more distances in one day than he used to be able to do in a lifetime."—*Modern Man Is Obsolete*, pp. 15, 16, Viking Press, 1945.

This sudden expansion of human knowledge was not anticipated by most people living at that time, not even by the man handling inventions and discoveries. An interesting illustration of this, together with comment on it, is given in the *Scientific American* of October 16, 1915:

"Some one poring over the old files in the United

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States Patent Office at Washington the other day, found a letter written in 1833 that illustrates the limitations of the human imagination.

"It was from an old employee of the patent office, offering his resignation to the head of the department. His reason was that as everything inventable had been invented, the patent office would soon be discontinued, and there would be no further need of his services, or the services of any of his fellow clerks. He therefore decided to leave before the blow fell.

"Everything inventable had been invented! The writer of this letter traveled in a stagecoach or a canal boat. He had never seen a limited train or an ocean greyhound. He read at night by candlelight, if he read at all in the evening; more likely he went to bed soon after dark, and did all his reading by daylight. He had never seen a house lighted by illuminating gas. The arc and incandescent electric lights were not to be invented for nearly a century. If he had ever heard of electricity, he thought of it as mysterious and dangerous fluid that strikes from the clouds during a thunderstorm. That it could be harnessed to do man's will had never occurred to him.

"He never heard the clicking of a telegraph sounder. The telephone would have seemed as wonderful to him as a voyage to the moon. Motion pictures would have reminded him of black art,

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and the idea that a machine could be invented whereby a man would fly above the clouds like a bird, ascending and descending at will, would have seemed to him utterly absurd.

"The modern printing press; the linotype machine, which seems almost to think; the X-ray, by means of which surgeons diagnose disease and injury and lay out their work with scientific certainty—these things were yet to be invented long after he was dead. He could not imagine the automobile, now so common that it covers the streets and roads of all the world.

"He could not dream that a cannon would be made to throw a projectile more than twenty miles; that repeating rifles, revolvers, and machine guns would be invented; that steel monsters of the deep would speed invisibly under the seas with power to send a giant ocean liner to the bottom within a matter of moments."

How surprised this patent office clerk would be if he were alive today to see the increasing number of patents being granted each year. In 1833, when he decided to quit, there were only 586 patents granted. But in 1959, 126 years later, instead of inventive ideas being exhausted, the number of patents granted totaled 52,184, an approximate 9,000 per cent increase.

It may well be said that more inventions and discoveries were made in the 150 years between 1795

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and 1945 than in all previous human history. This is clearly indicated by the *Encyclopedia Americana*, which listed 324 great inventions during the 150-year period indicated, but only 82 from the third century B. C. to 1795.

Yet, in the last fifteen years (1945-1960), more has been achieved than in the preceding one hundred fifty. Fifteen years ago: There were no automatic washing machines, driers, dish washers, electronic ovens or garbage disposals to aid the housewife.

Automatic heating and air conditioning of homes were unknown.

Power lawn mowers, garden tractors, rotatillers, and automatic shift, power steering, power brakes, and tubeless tires in cars were unheard of.

Nylon hosiery, Orlon suits and Dacron shirts did not exist, and Mylar recording tape and Delrin zippers were as yet undiscovered.

There were no: fiberglas or plastic-bodied boats, cars, or dinnerware; long-playing and stereophonic records; synthetic diamonds; polio vaccine, tranquilizers, oral contraceptives, or insulin therapy for diabetes.

Steam irons, home permanents, and electric shavers were gems unfound by inventors, as were the electronic flash, stereo, and photoelectric cameras, and transistor pocket-sized radios and record players.

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No ball-point pens, electric typewriters, or teaching machines aided the student, for they were to be of a future age.

In technology, solar heating, jet planes, rockets, missiles, and nuclear reactors to power submarines and ships were uninvented.

There were no:

Fuel cells that convert fuel to electricity without moving parts and that are twice as efficient as combustion engines.

Electroluminescence built in special glass panels to light up the room instead of light bulbs.

Thermoelectric generators based on thermocouples which convert heat directly into electricity to run radios, light electric bulbs, turn fans, and heat baby bottles.

Transistors, which make it possible to pack an average of 500,000 electronic parts into one cubic foot, replacing vacuum tubes in radios, record players, and electronic computers.

Molecular electronics capable of developing a complete communications receiver the size of a pea.

It was during this period that the atomic age began when the first atomic bomb was dropped on Hiroshima, Japan, on August 6, 1945. Then twelve years later on October 4, 1957, the space age began by the launching of the first Russian satellite. Never in human history has there been so many great eras arising in such rapid succession. Dr. Henry

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Morgenthau well saw the significance and said: "It took 200 years for the invention of gun powder to become common in society; 112 years for photography; 56 for telegraph; 35 for radar; 12 for television; 6 for atomic bomb; and 4 for the transistor. This means that changes, which men once would take six or seven generations to get used to, now take place in six or seven years."

It is indeed a truth that the scientific progress made in the last fifteen years doubled all previous knowledge. It has been estimated that in the next seven or eight years all previous knowledge will be again doubled. This steep, near-vertical acceleration of human knowledge has been described by Jonathan Norton Leonard, science editor of *Time* magazine, in the following words:

"The 20th century has a characteristic unique in history—the headlong, accelerating growth of scientific knowledge. The curve of knowledge is exponential, growing steeper like the curve of squares (1—4—9—16—25—36—49). It has changed men's lives more in the past 20 years than in the previous 50; more in that 50 years than in the previous 200. Man cannot, dare not stop its growth, though he does not know where it is taking him."—*The Time Book of Science*, p. 22, Random House, 1955.

According to the Denver Research Institute, the number of scientists presently living comprise 90

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per cent of the total number of scientists who have ever existed.

One thing that has helped to make this scientific advancement possible has been the high research spending by the leading nations of the world. Take the United States for example. In 1930 the private and public research expenditure was only \$166 million, but this jumped in 1959 to an unprecedented \$9.4 billion, or \$53 for every man, woman, and child in the United States.

To give the reader some idea about the tremendous advancement in human knowledge, the author, for lack of space, will discuss only one area of applied technology, namely, that of electronic computers.

THE MARVEL OF ELECTRONIC COMPUTERS

Electronic computers were originally designed to solve mathematical problems because their speeds are much faster than ordinary calculators. They can add, subtract, multiply, and divide at speeds ranging from 250 to 5,000 calculations per second. A mathematical problem that would take a mathematician a hundred years to solve could be solved by a computer in mere seconds.

However, their use is not limited to merely solving scientific problems by mathematicians and scientists. Of the more than 11,000 computers now in

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use, some have been used in banks in handling accounts and sorting checks, by the Internal Revenue Bureau in scrutinizing tax returns, by insurance companies, Census Bureaus and Social Security agencies in handling their filing systems, by airlines in handling reservations, by railroads in keeping track of cars, and by stores in keeping proper inventories. Others have been used in manufacturing processes in chemical factories, in coining trade names by pharmaceutical companies, and in making many of the day-to-day management decisions for larger corporations. Still others have even been used in analyzing opposing moves on ball fields, predicting election returns, or formulating bologna recipes.

How dependent on computers the American economy and national defense are, is pointed out by *Life* Associated Editor, Warren R. Young, in the following paragraph:

"The American economy, in short, is approaching the point of no return in its reliance on computers. If all the computers now in operation caught some electronic disease, it would be a crippling blow, something like national brain fever. Telephone service would break down. Insurance companies would be hopelessly snarled, for not enough people could be found to keep track of their voluminous accounts. All space and satellite shots would stop, while signals from those al-

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ready aloft would be meaningless. Piloting jet planes would scarcely be practical without computers to help, nor could new planes or rockets of modern quality be designed by men alone. While the sausage-making could still go back to human-formulated bologna, several fully automated plants now going into service to produce ammonia, vinyl plastic and gasoline would have to shut down, as would automated machine-tool departments in many factories. Without the robot brains to crank out the orders, the 'slave' machines in these plants would not work."—*Life*, March 3, 1961.

Computers, besides computing and doing mechanical chores, can also talk, translate, read, and carry on a conversation. According to one report, the modern computers can talk 75,000 words a minute.

Since June, 1959, an IBM machine, with a vocabulary of 55,000 Russian word stems has been translating the Moscow newspaper *Pravda* into English at the rate of 1,888 words a minute, compared with human translators at the average rate of 2,600 words a day.

A machine that can read printed words as fast as a computer can translate them has recently been developed by Baird-Atomic for IBM. The optical-electronic print reader, one of several optical scanners that have been developed, reads alphabet characters, punctuation marks, and numbers from a

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filmed copy of the original publication. It scans the film and recognizes (one at a time) 1,000 Russian characters per second.

According to a Chicago Associated Press dispatch of December 30, 1959, electronic computers have learned to carry on a simple conversation and detect obvious lies. E. S. Berkeley described how a computer, with a vocabulary of 300 English words fed into its memory, was able to talk with its operator about the weather in the following manner:

Operator: Did you enjoy the rain we had this afternoon?

Machine: Not really. What I like is sunny weather.

Operator: In hot weather one needs at least one bath every day.

Machine: Yes, I was just out and it was sweltering.

Operator: When Christmas comes we will have some colder weather.

Machine: Cold? Yes, it's usually frosty during December.

Operator: Today is clear weather. Will it last?

Machine: Let me have no lying. . . . How can overcast weather and the clear sky you mention co-exist?

A new machine called the "Preceptron" is able to learn things by studying its environment. It can see pictures, and in future version will hear words.

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It remembers what it has seen and identifies new shapes similar to those it has seen before.

According to the British Information Service, a new, almost human, and already semieducated robot with ability to see, to read, to write, and even to talk, is being built in London. The "big brain" will have 4,000 cells and an "eye" of 100 photoelectric cells. Hopes are that the "big brain," which should be ready for action in about a year, will be able to recognize people and faces.

IBM's 704, with the word THINK stamped on it, can learn by experience and show a fair degree of originality. Taught to play checkers, these computers have learned, after only 20 hours of play, to beat the man who programmed them. According to Dr. Norbert Wiener of MIT; man is threatened by computers of his own making. He said, "Once their human masters have set them to work, it is quite possible that an over-educated machine may sweep its masters to disaster before they realize clearly what it is up to." Dr. Wiener foresees a time when modern push-button war will become so swift and complex that only computers can think fast enough to make its strategic decisions.

Thus we see that we are living at the time of the end as foretold by Daniel: "Even to the time of the end: many shall run to and fro, and knowledge shall be increased" (Daniel 12:4). The time of the end mentioned in this verse by Daniel in the preceding

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three verses referred to the time when Christ (Michael) shall come the second time to deliver His people.

“At that time shall Michael stand up, the great prince which standeth for the children of thy people: and there shall be a time of trouble, such as never was since there was a nation even to that same time: and at that time thy people shall be delivered, every one that shall be found written in the book. And many of them that sleep in the dust of the earth shall awake, some to everlasting life, and some to shame and everlasting contempt. And they that be wise shall shine as the brightness of the firmament; and they that turn many to righteousness as the stars forever and ever” (Daniel 12:1-3).

Chapter 13

THE POSSIBILITY
OF SINFUL MAN
ON A SINLESS PLANET

SO FAR, no man has landed on the moon or any other planet, but it will not be too long before both of these events will happen. If everything works out according to schedule, one or more American astronauts will be on the moon by 1967. The Russians may get there even earlier. The rocket that will take the astronauts to the moon and back is called the Nova rocket, which was described in an earlier chapter.

Man's voyage to the moon will be followed by his round-trip to Mars or Venus. According to Krafft Ehricke, program director for Convair Astronautics in San Diego, California, this will be done in 1970 or 1971. He outlined a Venus flight plan in which a space craft with eight men aboard would travel

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295 days, survey from their ship for 24 days and return in 223 days. Travel time to Mars would be less: 138 days to reach the planet and 175 days to return. It is possible that there may be a few years' delay. But judging from what has been accomplished in the field of space science, we believe, sooner or later, man will be able to land on the moon and then on the planet Mars or Venus. If time permits, man's space flight will take him to regions beyond our own solar system and later even beyond our Milky Way galaxy. The trips to more distant planets will not rely upon chemical rockets as they are being used today, but atomic rockets, ion rockets, and eventually photon rockets, which are being considered and developed. When photon rockets are perfected, man may be able to travel at nearly the speed of light, some space experts claim.

CONTAMINATION—A MOST SERIOUS PROBLEM

The trip to Mars planned by the space scientists is worrying the microbiologists. A United Press dispatch from Washington on April 3, 1960, under the headline, "Invasion by Microbes From Mars is Feared," stated that foreign organisms brought back from Mars might incur disaster to our health, agriculture, economy or comfort. Dr. Joshua Lederberg, Nobel Prize-winning professor of genetics at

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Stanford University, believes that all human beings who visit other planets should be quarantined before returning until it is certain that they are not carriers of pestilence.

The same fear was expressed by Professor Philip Trexler, University of Notre Dame scientist, who long has engaged in research in the university's germ-free laboratory. He said that space explorers coming home from other planets might bring back new types of germs which could be as destructive to life as we know it now as an all-out nuclear war.

Besides his concern about contamination of our planet by germs from other planets, Professor Trexler is also absorbed about contamination of other planets by man. "Conceivably," he said, "a single contaminant from earth could overrun and destroy many forms of life on another planet."

From God's point of view, contamination of other planets by earth microbes is not as important as contamination of other planets by man's sin. It is doubtful that a God, who sacrificed His only begotten Son's life in order to cleanse this world of sin, would permit sinful man to contaminate other worlds with his sin. Leonard Lee wrote in *Tele-Notes* for November, 1959: "Of all the inhabited planets in the universe, ours alone has succumbed to the allurements of sin. Because the Saviour died to make our redemption possible so that sin would not continue forever, our world has been the focal

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point of the universe. All eyes have been turned in this direction as angels and sinless beings watch the great controversy between Christ and Satan. But now it would seem that men are attempting to conquer the universe. If successful in reaching the planets, man would spread the poison of sin and selfishness to other inhabited worlds. But God made the earth for man's home, and until sin is finally destroyed, man and the earth belong together . . .

"The great Creator guards the doors to other inhabited worlds. Only sinless man, redeemed and sanctified by the blood of Christ, will ever leave these earthly shores to live with Jesus in heaven and to associate with other unfallen beings on other planets."

Even from the moral point of view, thinking men doubt the wisdom of allowing man to be on other planets. Norman Cousins well observes this point in *The Saturday Review*, "He [man] has not demonstrated his fitness to exist on his own planet, with all its natural advantages, much less earn the right to roam the heavens."

Carsbie A. Adams made a similar observation in his book, *Space Flight*, "He cannot manage to get along in the bomb-like utopia of a lush planet. He cannot adequately feed, shelter, clothe, or educate himself, or prevent vast bigotry, crime, and war—even when all the cards are stacked in his favor.

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What would such a clown do if at large in the galaxy?"¹

Dr. Harvey H. Springer gave one further reason why man cannot get very far from this earth. He said: "If man can get into a space ship and travel to another planet, he would escape the judgements of Almighty God; and that is not possible. If the judgements of God are going to take place upon the earth, then that is where man is going to be . . .

"If man had access to space to go to another planet, why should he mess around and run for the rocks and the mountains and the dens, to hide from the face of the Lamb? [Revelation 6:16]. Why not just take a space ship and go over to Mars and stay there until the Tribulation Period is over? No, it is not possible. Man is going to pay for the penalty of his sin right here upon this earth."—*The Space Age in the Light of Bible Prophecy*, pp. 16, 17.

Since man is capable of leaving his own planet and going to other planets, thus escaping God's judgment and bringing sin to sinless planets, provided he is allowed enough time in research and development in the space science, Jesus' return to execute His judgments must be imminent.

1. By permission from *Space Flight*, by Carsbie A. Adams. Copyright, 1958, McGraw-Hill Book Company, Inc., p. 237.

Chapter 14

POPULATION EXPLOSION

THE WORLD today has 2.9 billion people, and has been increasing at the rate of over 40 million each year during the past decade. In 1959 alone, the world's population rose by 90 million—equivalent to a nation the size of Japan.

The increase has been rapid especially during the last two centuries. Thus Europe increased from 188 million in 1800 to 266 million in 1850 and 401 million in 1900. As we can see, it more than doubled in a single century.

In Asia, the population has gone from 600 million to 1.544 billion in the last 150 years and is now growing at the rate of 24 million people a year. South America has increased from 15 million to 131 million in the same length of time.

The population increase has especially been rapid among the Chinese. On the Chinese Main-

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land, it is increasing at the rate of more than a million a month. Forty years from now there will be a billion and a half Chinese. It is said that in another 50 years half of the world's population may be Chinese.

The population increase in Africa has also been rapid. There were 100 million people in Africa in 1850, but by 1950 the number had increased to 198 million, almost doubling the figure of a century ago. Estimates show that forty years from now the world will be 70 per cent Afro-Asian.

Even in our own less-productive United States, there has been an increase of over 10 million in the last four years, and a population of 200 million is expected by 1970.

Is it any wonder that some people are alarmed at such rapid rise of human population in the world. Robert Coughlan wrote in *Life* for November 23, 1959: "Whereas it had taken the first 5,000 years of civilization to raise man's numbers to a billion, it took less than 100 years to double this to two billion, the mark reached in 1920s. To double this one again to the four billions expected by 1980 will have taken less than 60 years. And if the present rate of increase (16% a year) is maintained, the figure will begin doubling every 40 years, billions piling upon billions in an explosive chain reaction of human fertility."

The rapid increase in human population was to a

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great degree brought about by advances in scientific medicine made by such men as Pasteur, Jenner, Fleming, and countless other great researchers. As a result, infant mortality declined and longevity increased. According to the United States Public Health Service, the death rate decreased 58 per cent during the 1945-56 period in diseases in which antibiotics were effective, with diphtheria topping the list with a 92 per cent drop. The average life span in ancient Rome was only 30 years, but in some countries it is now 70. The old age group in this country is becoming increasingly larger every year, and it imposes upon both the federal and local governments the burden of caring for them. The recent White House Conference on aging and the proposed controversial old age medical aid bill all center around this group of senior citizens.

NO HUMAN SOLUTIONS

What can be done in view of the explosive point toward which the rapidly rising human population is heading? On the surface, two ways are open: We can either limit the production by various means of birth control or transport the excess population to the moon or some other planet, or both. Now let us see what hope we have in birth control.

Here and there people have been practicing birth control. There were individuals who were doing

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it even in ancient Bible times. Some rely on the natural rhythm period, others employ the various types of contraceptives. Still others receive operations on certain parts of their reproductive organs under government supervision, as is done in India. From now on some are going to try the newly invented oral anti-ovulant, Enovid, a pharmaceutical product made by G. D. Searle Company and approved by the Food and Drug Administration. It is a steroid resembling the natural hormone progesterone, which has egg-inhibiting properties.

What are the results to date? Population is still increasing at an alarming rate, even in countries where birth control is encouraged by the government, such as in India and Japan. As to the future, it is dark indeed. The reasons are simple: (1) When God gave the command: "Be fruitful and multiply," He placed in man and woman the necessary sexual instinct to fulfill the command, and this command has never been repealed. (2) As long as human nature (self-preservation) has not changed, there will always be rivalry between races, nations, religious groups, and political parties, in which "numerical strength" plays a most important role. And numerical strength is what determines the result of an election or the outcome of a battle. Military authorities admit we were beaten in North Korea in the last Korean War not because of the superior weapons of the Chinese, but because we

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were outnumbered by them. Numerical superiority gives strength to a nation, a race, a religious sect or a political party.

The importance of man power to the United States at this time was re-emphasized by *Life* in its January 13, 1961 issue. The article reads: "It is the soldier's lot to feel unwanted and unappreciated in peacetime. Particularly in this age of missiles and nuclear weapons, the simple job of the foot soldier—slogging along through mud and swamp or wherever the battle takes him—has been obscured. Americans have too easily forgotten that the job of the infantry is as important as ever. In fact, right now it is of the gravest importance to raise him up and redress an unbalance in the nation's defenses.

"The situation revolving around Laos this week revives the image of the foot soldier who, with courage in his heart and tactics in his mind, is a sturdy weapon the U. S. must have in *greater numbers* (italics ours) and strength to fight successfully in remote, limited wars."

While the West is discussing birth control, the Communists are emphasizing more than ever the importance of man power. Thus Red China is not worried by the Malthusian theory that population growth will outstrip food production. Its leaders believe that even in peacetime "labor is capital" and the more field and factory hands they have, the stronger the country will become.

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The Russians are gaining over the United States in population growth. Russia's birth rate was 25.3 per thousand in 1958 compared with 24.3 per thousand for the U. S., and only 7.2 Russians per thousand died in 1959 while the U. S. mortality rate was 9.5 per thousand.

Under these alarming conditions, it would be committing national suicide for any nation to encourage birth control on a large scale. Like disarmament, unless all nations adopt the same restriction at the same time, those that adopt the restrictions for the benefit of the whole human race will someday realize their serious blunder. Since no intelligent nation or group of people will foolishly commit such a blunder, the prospect of birth control as a means of solving the problem of population explosion does not look very bright.

Now let us turn to our second proposed solution to this grave problem, that of transporting excess population to the moon or other planets. Dr. Richard N. Fagley, author of *The Population Explosion and Christian Responsibility*, made this very suggestion (p. 81). While recent advances in space science make it look feasible to send human beings to the moon or other planets, it is actually an impossible task for any large numbers. Dr. Lee A. DuBridge of the California Institute of Technology has this to say regarding it: "I am told that excess population is piling up on earth at the rate of 45,000,000

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people per year, or 123,000 per day. What a passenger business that's going to be! The first colony will be on the moon, I suppose. But who is going to lay the pipeline to get oxygen up to them? And water? And what about food? And space suits? With a few million people on the moon, I wonder how many space suits will get punctured every day. (A punctured space suit in a perfect vacuum is a most unpleasant accident.) Every day! That reminds me—a day on the moon is 28 earth-days long. Sunshine for 336 hours, then darkness for 336 hours. A sizzling temperature of 220° F. by day and minus 220° at night.”—*American Journal of Physics*, November 1960, p. 723.

So here we are. There is no human solution to population explosion. The rapid population increase will go on, according to the elaborate mathematical calculations of physicist Heinz von Foerster of the University of Illinois, until Friday, November 13, A. D. 2026, the doomsday for the human race on this earth when the world's population will be squeezed to death.

So we have come to the end of the rope, humanly speaking. Fortunately, Jesus, who has sacrificed His life to save humanity, will come again before the population problem becomes very serious. And there will be a lot of room for the redeemed in the New Jerusalem, for He promised in John 14:1-3: “Let not your heart be troubled: ye believe in God,

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believe also in me. In my Father's house are *many mansions*: if it were not so, I would have told you. I go to prepare a place for you. And if I go and prepare a place for you, I will come again, and receive you unto myself; that where I am, there ye may be also." Again He says in Revelation 22:12: "And Behold, I come quickly; and my reward is with me, to give to every man according as his work shall be."

Chapter 15

EITHER, OR

IN 1906 Dr. Einstein announced his famous energy-mass equivalence equation:

$$E = mc^2$$

where E is the amount of energy, m the mass of the object, and c the velocity of light. Since c is very large (30,000,000,000 centimeters per second), a relatively small amount of mass can be converted into an enormous amount of energy. Thus, according to this equation, the annihilation of one gram (one twenty-eighth of an ounce) of mass would yield 21 trillion calories, enough energy to heat and vaporize 9,500,000 gallons of water. The annihilation of 1,000 grams (or 2.2 pounds) of mass would produce 25,000,000,000 kilowatt-hours of electricity. This is equivalent to the total output of the electric power industry of the United States for a two-month period, or to the amount of energy that

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would be liberated by burning 3 million tons of coal.

The only thing superior to nuclear fission and nuclear fusion in power is what Jesus described to his disciples at one time, "Verily I say unto you, If ye have faith as a grain of mustard seed, ye shall say unto this mountain, Remove hence to yonder place; and it shall remove; and nothing shall be impossible unto you" (Matthew 17:20).

The Einstein equation remained a theory until July 16, 1945, when the first atomic bomb was exploded at Alamogordo, New Mexico. The light flash of the exploding bomb illuminated mountains 10 miles away, the heat completely vaporized the steel tower upon which the bomb was hung, and the desert surface was fused to glass for a radius of 800 yards.

THE POWER OF DESTRUCTION

The atomic bomb dropped on Hiroshima, Japan, on August 6, 1945, had an explosive force equivalent to that of 20,000 tons of TNT. It killed 78,150 persons outright, injured 100,000 more, left 200,000 homeless, and destroyed or damaged 75 per cent of the city's buildings. The heat of the exploding bomb was so intense that at a distance of a mile and one-half from the bomb the flash heat was strong enough to blister the face or set a forest afire.

Three days later a second atomic bomb was

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dropped on Nagasaki, taking 73,840 lives. The smoke rose 50,000 feet into the air and was visible for more than 175 miles.

Then in November, 1952, came the horrifying report about the hydrogen bomb test at Eniwetok. New York Representative Starling Cole, chairman of the Joint Committee on Atomic Energy described it in these words: "The thermonuclear test of 1952 completely obliterated the test island in the Eniwetok Atoll. It tore a cavity in the floor of the ocean—a crater—measuring a full mile in diameter and 175 ft. in depth at its lowest point. . . . In other words, an area covering 300 square miles would be blanketed by this hydrogen explosion."

The hydrogen bomb today has the destructive force of 20 megatons (20 million tons of TNT), or is 1,000 times more powerful than the old atomic bomb. If the 20 million tons of TNT were carried by a freight train, allowing 50 tons to each 50-foot long freight car, that freight train would be 3,778 miles long. In other words, it would reach all the way from Los Angeles to Boston and some 600 miles beyond. Since all the railroad cars in the United States can carry only about 112 million tons of freight, there are only enough railroad cars in the United States to carry the TNT equivalent of about six hydrogen bombs.

Imagine what would happen if a 3,787 mile long freight train loaded with TNT exploded. That is

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what a hydrogen bomb does when it explodes. Wrote Dr. Warner Wells in the November, 1960, *Bulletin of the Atomic Scientists*, "One such bomb detonated over the center of Manhattan would destroy all of greater New York and everyone within a radius of twenty-five miles, while momentarily the waters within the adjacent Hudson and East Rivers would be displaced or evaporated to expose their bare river beds. Depending on wind direction, fallout could be lethal to other millions within a radius of several hundred miles."

The 57-megaton bomb exploded by the Russians at Novaya Zemlya in the Arctic on October 31, 1961, was nearly three times as powerful. According to *Newsweek* of October 30, the destructive power of such a 50-megaton bomb would:

Dig a crater one mile wide and 300 feet deep—

Kill everyone, sheltered or unsheltered, within a distance of 3 miles—

Level all steel-reinforced office buildings within 5 miles—

Kill everyone above ground within a radius of 7 miles—

Flatten brick homes within a 10 mile radius—

Destroy wood-frame homes 16 miles away—

Cause second-degree burns and ignite fires as far as 35 miles away.

While the atomic bombs dropped on Japan were carried by conventional planes, nuclear weapons

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may be carried to enemy territory by missiles. Two well-known nuclear bomb-carrying missiles are the Minuteman and the Polaris.

The Minuteman is an Intercontinental Ballistic Missile which carries in its warhead a hydrogen bomb whose destructive power is equivalent to half a million tons of TNT. In other words, one Minuteman carries more destructive power than all the bombs dropped on Berlin during World War II by all planes in all raids.

Polaris missiles are carried by atomic submarines. An atomic-powered submarine carrying 16 Polaris missiles can rain more destruction on the world than was done by all the bombs dropped by both sides in World War II. Or to state it another way, such an atomic submarine has more destructive power than has been expended by all the navies of the world up to the present time.

If one atomic submarine can do so much damage, what will it be like when there are 45, the number which the Navy Department has requested?

Now that man can be put in a space ship, there will be no need of delivering nuclear weapons by missiles thousands of miles away. He can do it more easily and accurately by dropping his deadly cargo from his space ship directly over the enemy territory one or two hundred miles up in space.

Right now there are only three major powers which have stockpiles of nuclear weapons, namely:

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The United States, Russia, and Great Britain. According to one news report, the United States has now a stockpile of atomic weapons roughly equal to 50,000 A-bombs of the size that blasted Hiroshima. In the next three years this nation will add the equivalent of another 30,000 Hiroshima type bombs.

France has already succeeded in exploding several of her atomic bombs, so soon she will be another nuclear power. According to Sir Charles P. Snow, within six years at most, Red China and several other nations will also have a stock of atomic bombs.

Not only will more and more nations of the earth have nuclear bombs, but the bombs will also be made more and more powerful. In fact, modern weapon planners have already envisioned instruments of destruction so lethal that one of them will suffice to incinerate the entire continent of Europe or the United States west of the Rockies. Such "doomsday weapon" will have the destructive power equivalent to 1,000 megatons or one billion tons of TNT.

Such a massive doomsday weapon could be carried to the coast of a target continent in a submarine and fired by a pushbutton technique from a point halfway round the world. Or it may be delivered from a monster orbiting satellite. It would be triggered to go off over enemy territory and would va-

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porize everything and everybody in an area the size of the state of Texas.

A more disturbing fact is that such big bombs can be made inexpensively by smaller nations with an emerging atomic technology. According to physicist W. H. Clark (*Time*, Nov. 11, 1961), "A 100-megaton bomb is roughly \$1,500,000. A 1,000-megaton bomb would cost \$6,000,000."

Equal destruction can be done by a large number of smaller bombs. The Rand Corporation has made studies of what might happen in a large attack by 1,850 planes each carrying a 20-megaton bomb: 1 million people might survive in the United States, 3 million might survive in Russia.

Even a more moderate-sized attack will be almost as horrible. A recent congressional hearing brought out these facts: An enemy attack with 263 nuclear bombs, totalling 1,446 megatons, on 70 key cities and 154 military bases would kill 23 million Americans outright and fatally injure another 25.9 million. It would also inflict nonfatal blast and burn injuries on 7,300,000 and harmful radiation dosages upon 12.7 million.

THE POSSIBILITY OF WORLD WAR III

From the human standpoint, a third world war is not only possible, but very probable. And when it comes, it will mean total destruction—of people,

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governments, and civilizations. Many of the world's most brilliant thinkers have expressed such fears. The following are typical examples:

Dr. Robert Gordon Sproul, president of the University of California, told the Rotarians in San Francisco in 1947, "With the atom bomb now loose we have found a way to die together."

"Man is in possession today of almost total power," says Norman Cousins in the *Saturday Review*. "The next war will be an undertaking in mutual suicide."

"Future history, in fact, may not last very long," says Dr. Harold C. Urey, nuclear scientist and Nobel Prize Winner.

"For all we know it may be the incomprehensible and inscrutable Will of God to make the twentieth century 'Closing Time' for the human race," says Thomas E. Murray of the Atomic Energy Commission.

There are several ways by which the third World War may be brought about. Sir Charles P. Snow, recently addressing the American Association for the Advancement of Science on the subject of atomic weapons, said: "We know, with the certainty of statistical truth, that if enough of these weapons are made—by enough states—some of them are going to blow up. Through accident, folly, or madness." He believes that the present trend will see some of these bombs exploding in ten years or less.

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The start of a nuclear war by accident or error is voiced also by others: "The situation is tense and conspicuously unstable. Any spark—a false radar warning, an accidental overflight, a failure in communications—could trigger an accidental war."—*Mershon National Security Program*, p. 18.

Dr. Albert Schweitzer was quoted by *Newsweek* of May 16, 1960, as saying: "I have a great fear that there will be a third World War—it will start by accident. As more nations join the insane race for superiority in weapons, the probability of mistake mounts daily."

Not long ago, the Supreme Allied Commander General Lauris Norstad warned the 650 NATO delegates at the Atlantic Congress in London that the greatest danger to the peace of the world is a war by error. "A meteor or some other innocent object reflected on a radar screen might be mistaken for an approaching intercontinental ballistic missile with a hydrogen warhead, and someone for sake of survival might push the fatal button that would plunge the world into nuclear war."

That World War III may come as a result of man's folly was expressed by several keen observers of world affairs:

David Lawrence pointed this out in the *U. S. News and World Report* of September 7, 1959. He said: "Missiles and nuclear bombs are in themselves no menace to mankind—nor are the 'conven-

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tional' weapons which can inflict widespread destruction. The menace is the man who, in disregard of the wishes of his people, can order the trigger pulled. . . .

"There can be no safety for any democracy as long as there is in existence anywhere an armed autocracy which can, without warning, destroy us.

"The basic cause of World War I and World War II was the power of an autocratic one-man government to make war on other nations."

The December 21, 1959, issue of the *U.S. News and World Report* published an article carrying the sensational title: "The Coming Choice for U. S.: Fight or Surrender?" Its opening paragraph reads thus:

"At some point, not many years from now, the American people are likely to be offered this choice: Surrender or fight a nuclear war. And, the way things are going, the United States could lose that war.

"These are the studied conclusions of some key officials in the innermost councils of the U. S. Government."

It is inevitable because, as the article pointed out, "Only through world dominance by a single power can assurance of safety from nuclear war be established.

"Soviet Russia, pushing out as U. S. draws back, is tilting the balance of power steadily in her direc-

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tion. When that tilt seems to her rulers to be decisive, she then will be tempted to offer the United States the fateful choice: Surrender or fight a nuclear war."

The article also referred to the report released by the Senate Foreign Relations Committee on December 6, 1959, which states: "To assume that the level of mutual destruction now possible from a total nuclear war, or the magnitude and intensity of the accompanying radioactive fallout, is sufficiently high to make nuclear war 'suicidal'—and therefore 'impossible'—is but to evade the most serious military problem that this nation has ever faced."

In view of the very dangerous situation that the world is in, is it any wonder that "men's hearts (are) failing them for fear, and for looking after those things which are coming on the earth" (Luke 21:26), just as Jesus predicted as He foresaw nearly 2,000 years ago today's world conditions.

COMING EVENTS ACCORDING TO THE BIBLE

Christian thinkers around the circle of the globe are coming more and more to realize that Christ and His promised advent constitute the only hope for a world that is threatened with mass destruction by nuclear warfare.

There was a time when statesmen, scientists, educators, and popular clergymen ridiculed the idea

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that the world might come to an end and that Jesus would come again. They called those who so believed "alarmists" and "calamity-howlers." But since the atomic age began, the ridicule and the laughter have ceased. Instead, they call the present time "minutes to midnight." Here is a typical confession by a highly respectable theological seminary professor:

"Within the pages of the New Testament one is forever stumbling upon passages, long ignored, which suddenly speak directly to the mood of the hour. From utter irrelevance they become luminous with meaning. The closing lines of 2 Peter are a case in point. A year ago they were completely foreign to our thinking, but listen to them today!

" 'The heavens shall pass away with a great noise, and the elements shall melt with fervent heat, the earth also and the works that are therein shall be burned up. . . . Nevertheless we, according to his promise, look for new heavens and a new earth.'

"Much of the current interest of these words stems from the fact that they are so pat as a prediction of the specific manner in which the world may now be destroyed. My interest, however, is in the mood these words reveal. There is a threat and a promise, a devastating fear and a glorious hope. . . .

"This lack of awareness of the common peril

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points to the task of the Christian church. We must stop smiling complacently at the way in which the Millerites once played upon the fears of the credulous. This time the final explosion can too easily occur. This time it is not the credulous who believe but the incredulous, not the hysterical but the coldly scientific. The task of the church is to make their fear real to the great mass of the people—to make the great mass of the people recognize the full dimensions of the peril in which they stand.”—Winthrop S. Hudson in *The Christian Century*, Jan. 9, 1948.

In the same chapter of 2 Peter are these words: “The present heavens and earth are, also by God’s command, being carefully kept and maintained for the fire of the day of judgment and the destruction of wicked men” (2 Peter 3:7).¹

From the above we see (1) that it is God who is going to destroy this world, not men, (2) that wicked men are going to be destroyed with it, and (3) that a new earth will replace the old.

Further, Revelation 11:18 teaches that God will destroy those who will destroy the earth, “. . . thou shouldest give reward unto thy servants the prophets, and to the saints, and them that fear thy name, small and great; *and shouldest destroy them which destroy the earth.*”

1. From *The New Testament in Modern English*, copyright J. B. Phillips 1958. Used by permission of The Macmillan Company.

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Thus we have come to the stark conclusion that either Jesus has to come soon, or man will destroy both himself and the earth. There can be no alternative. It is a case of "Either, Or." "Either" means the banishment of evil, sin, and iniquity and the reign of peace thereafter. "Or" means disaster, catastrophe, and the end of everything, good as well as evil. Fortunately, man is not given the prerogative to shape the last events of the earth's history. Before this world drifts into a horrible nuclear conflagration, Jesus will "finish the work, and cut it short in righteousness: because a short work will the Lord make upon the earth" (Romans 9:28). "Behold, he cometh with clouds; and every eye shall see him, and they also which pierced him: and all kindreds of the earth shall wail because of him" (Revelation 1:7).

Describing this time, the Bible states, "The kings of the earth, and the great men, and the rich men, and the chief captains, and the mighty men, and every bondman, and every free man, hid themselves in the dens and in the rocks of the mountains; and said to the mountains and rocks, Fall on us, and hide us from the face of him that sitteth on the throne, and from the wrath of the Lamb: for the great day of his wrath is come; and who shall be able to stand?" (Revelation 6:15-17). But the righteous shall look up and say, "Lo, this is our God; we have waited for him, and he will save us; this is the LORD; we

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have waited for him, we will be glad and rejoice in his salvation" (Isaiah 25:9). The kind of life you live now and the decisions you make for the future will determine your destiny. It is the author's wish that when Jesus comes you might be found among the righteous.